U.S. Department Of Energy Office of Science



Fiscal Year 2008

Performance Evaluation of Brookhaven Science Associates for the Management and Operations of the Brookhaven National Laboratory

February 2009



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I. OVERALL SUMMARY RATING/FEE

Performance-Based Score and Adjectival Rating:

The basis for the evaluation of Brookhaven Science Associates (the Contractor) management and operations of the Brookhaven National Laboratory (the Laboratory) during FY 2008 centered on the Objectives found within the following Performance Goals:

- 1.0 Provide for Efficient and Effective Mission Accomplishment (Quality, Productivity, Leadership, & Timeliness of Research and Development)
- 2.0 Provide for Efficient and Effective Design, Fabrication, Construction and Operations of Facilities
- 3.0 Provide Effective and Efficient Science and Technology Research Project/Program Management
- 4.0 Provide Sound and Competent Leadership and Stewardship of the Laboratory
- 5.0 Sustain Excellence and Enhance Effectiveness of Integrated Safety, Health, and Environmental Protection
- 6.0 Deliver Efficient, Effective, and Responsive Business Systems and Resources that Enable the Successful Achievement of the Laboratory Mission(s)
- 7.0 Sustain Excellence in Operating, Maintaining, and Renewing the Facility and Infrastructure Portfolio to Meet Laboratory Needs
- 8.0 Sustain and Enhance the Effectiveness of Integrated Safeguards and Security Management (ISSM) and Emergency Management Systems

Each Performance Goal was composed of two or more weighted Objectives and most Objectives had a set of performance measures, which assisted in determining the Contractor's overall performance in meeting that Objective. Each of the performance measures identified significant activities, requirements, and/or milestones important to the success of the corresponding Objective. The following describes the methodology utilized in determining the Contractor performance rating.

Each Objective within a Goal was assigned a numerical score by the evaluating office. Each evaluation measured the degree of effectiveness and performance of the Contractor in meeting the Objective and was based on the Contractor's success in meeting the set of Performance Measures/Targets identified for each Objective as well as other performance information available to the evaluating office from other sources to include, but not limited to, the Contractor's self-evaluation report, operational awareness (daily oversight) activities; "For Cause" reviews (if any); other outside agency reviews (OIG, GAO, DCAA, etc.), and the annual 2-week review (if needed). If no performance measures/targets were utilized the description of the general expectations for the success of the objective was utilized as the baseline of the effectiveness and performance of the Contractor in meeting the corresponding Objective and in determining the score assigned. The Goal score was then computed by multiplying the numerical score by the weight of each Objective within a Goal. These values were then added together to develop an overall score for each Goal. This score was then compared to Table A to determine the overall grade for each Goal. A set of tables is provided at the end of each Performance Goal section of this document to assist in the calculation of Objective scores to the Goal score. The raw score (rounded to the nearest hundredth) from each calculation was carried through to the next stage of the calculation process. The raw score for Science and Technology and Management and Operations was rounded to the nearest tenth of a point for utilization in determining fee as discussed below. A standard rounding convention of x.44 and less rounds down to the nearest tenth (here, x.4), while x.45 and greater rounds up to the nearest tenth (here, x.50).



| Final Grade | A+ | A | A- | B+ | В | B- | C+ | С | C- | D | F |
|----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-------|
| Total Score | 4.3-4.1 | 4.0-3.8 | 3.7-3.5 | 3.4-3.1 | 3.0-2.8 | 2.7-2.5 | 2.4-2.1 | 2.0-1.8 | 1.7-1.1 | 1.0-0.8 | 0.7-0 |

Table A. FY 2008 Contractor Letter Grade Scale

Based on the evaluation of Brookhaven Science Associates performance against the Goals and Objectives contained within the FY 2008 Performance Evaluation and Measurement Plan (PEMP) the scores and corresponding grades awarded for each are provided within Table B below. Specific information regarding the Contractor's performance in meeting each of the Goals and their corresponding Objectives is provided within Section II of this report.

| S&T Performance Goal | Numerical Score | Letter Grade | Weight | Weighted Score | Total Score | | |
|--|--------------------|-----------------|--------|-------------------|----------------|--|--|
| 1.0 Mission Accomplishment | 3.8 | A | 38% | 1.45 | | | |
| 2.0 Design, Fabrication, Construction and Operations of Facilities | 4.0 | A | 37% | 1.46 | | | |
| 3.0 Science and Technology Research Project/Program Management | 3.6 | A- | 25% | 0.89 | | | |
| | Total Score | | | | | | |
| M&O Performance Goal | Numerical Score | Letter Grade | Weight | Weighted Score | Total Score | | |
| 4.0 Leadership and Stewardship of the Laboratory | 3.5 | A- | 25% | 0.88 | | | |
| 5.0 Integrated Safety, Health, and Environmental Protection | 3.1 | B+ | 20% | 0.62 | | | |
| 6.0 Business Systems | 3.0 | В | 20% | 0.60 | | | |
| 7.0 Operating, Maintaining, and Renewing Facility and Infrastructure Portfolio | 3.4 | B+ | 15% | 0.51 | | | |
| 8.0 Integrated Safeguards and Security Management and Emergency Management Systems | 3.3 | B+ | 20% | 0.66 | | | |
| Total Score | | | | | | | |

Table B. FY 2008 Contractor Evaluation Score Calculation

Performance-Based Fee Earned:

Utilizing Table B, above, the scores for each of the Science and Technology (S&T) Goals and Management and Operations (M&O) Goals were multiplied by the weight assigned and these were summed to provide an overall score for each. The percentage of the available performance-based fee that was earned by the Contractor was determined based on the overall weighted score for the S&T Goals (see Table B.) and then compared to Table C. below. The overall numerical score of the M&O Goals from Table B was then utilized to determine the final fee multiplier (see Table C.), which was utilized to determine the overall amount of performance-based fee earned for FY 2008 as calculated within Table D. Based on the overall performance within the S&T and M&O Goals the Contractor is awarded \$7,178,000 in performance based fee for FY 2008.



| Overall Weighted Score | Percent S&T | M&O Fee |
|------------------------|-------------|------------|
| from Table A. | Fee Earned | Multiplier |
| 4.3 | | |
| 4.2 | 100% | 100% |
| 4.1 | | |
| 4.0 | | |
| 3.9 | 97% | 100% |
| 3.8 | | |
| 3.7 | | |
| 3.6 | 94% | 100% |
| 3.5 | | |
| 3.4 | | |
| 3.3 | 91% | 100% |
| 3.2 | 91 /0 | 100 /0 |
| 3.1 | | |
| 3.0 | | |
| 2.9 | 88% | 95% |
| 2.8 | | |
| 2.7 | | |
| 2.6 | 85% | 90% |
| 2.5 | | |
| 2.4 | | |
| 2.3 | 75% | 85% |
| 2.2 | 1570 | 05 70 |
| 2.1 | | |
| 2.0 | | |
| 1.9 | 50% | 75% |
| 1.8 | | |
| 1.7 | | |
| 1.6 | | |
| 1.5 | | |
| 1.4 | 0% | 60% |
| 1.3 | | |
| 1.2 | | |
| 1.1 | | _ |
| 1.0 to 0.8 | 0% | 0% |
| 0.7 to 0.0 | 0% | 0% |

Table C. - Performance-Based Fee Earned Scale

| Overall Fee Determination | | | | | | |
|--|--------|--|--|--|--|--|
| Percent S&T Fee Earned from Table C. 97% | | | | | | |
| M&O Fee Multiplier from Table C. | X 100% | | | | | |
| Overall Earned Performance-Based Fee | 97% | | | | | |

Table D. – Final Percentage of Performance-Based Fee Earned Determination

| Earned Fee Calculation | |
|--|-------------|
| Available Fee | \$7,400,000 |
| Overall Earned Performance -Base Fee (Table D) | X 97% |
| Earned Fee | \$7,178,000 |

Table E. – Earned Fee Calculation



II. PERFORMANCE GOALS, OBJECTIVES, AND MEASURES/TARGETS

1.0 Provide for Efficient and Effective Mission Accomplishment (Quality, Productivity, Leadership, & Timeliness of Research and Development)

The Contractor produces high-quality, original, and creative results that advance science and technology; demonstrates sustained scientific progress and impact; receives appropriate external recognition of accomplishments; and contributes to overall research and development goals of the Department and its customers.

The weight of this Goal is 38%.

The Provide for Efficient and Effective Mission Accomplishment Goal measured the overall effectiveness and performance of the Contractor in delivering science and technology results which contributed to and enhanced the DOE's mission of protecting our national and economic security by providing world-class scientific research capacity and advancing scientific knowledge by supporting world-class, peer-reviewed scientific results, which were recognized by others.

Objectives:

- 1.1 Science and Technology Results Provide Meaningful Impact on the Field
- 1.2 Provide Quality Leadership in Science and Technology
- 1.3 Provide and sustain Outputs that Advance Program Objectives & Goals
- 1.4 Provide for Effective Delivery of Products

SC's assessments of the Goal and related Objectives are summarized below. See Appendix 1 for the Program Offices' detailed evaluations.

Advanced Scientific Computing Research (ASCR)

• BNL continues to have very narrow participation in the ASCR program. BNL participates in only two SciDAC projects but lead one Climate SAP. Communications have improved and ASCR hopes that BNL will be more successful in future ASCR competitions.

Basic Energy Sciences (BES)

 Materials sciences research programs have demonstrated world leadership and sustained impact in superconductivity, photoemission spectroscopy, x-ray scattering and quantitative electron microscopy. Chemical sciences research programs have demonstrated sustained scientific progress and impact in the areas of thermal, photo-, and radiation-induced reactions, condensed media radiation sciences, electron transfer mechanisms, homogeneous photo-catalysis, and solar photoconversion.

Biological and Environmental Research (BER)

• BNL plays a lead role in BER's Atmospheric Radiation Measurement and Atmospheric Research Programs, and its scientists are internationally recognized.

BNL's radiochemistry and instrumentation research program scientists are world leaders, and their scientific contributions continue to make seminal advances in the field. This program is currently undergoing a difficult transition to focus on DOE relevant energy and environmental needs.

BNL's protein crystallography program has a high impact on its field, serving a large number of prominent biological scientists, especially in the Northeastern U.S.

BNL has a relatively small, high quality BER research portfolio spread across several program elements. BNL scientists in these programs are recognized nationally and



internationally and conduct high impact research in climate, radiochemistry and instrumentation, and structural biology. The scientific results have a high impact in their respective fields and are regularly recognized for their high quality. Research results are completed in a timely manner.

High Energy Physics (HEP)

• Through BNL's extensive leadership positions in the U.S. ATLAS collaboration, it manages ATLAS' U.S. operations program and hosts the Tier Computing Center and is developing an Analysis Support Center.

BNL has been extensively involved in developing the physics case for a long-baseline neutrino detector. BNL has been critical to the theoretical argument for the experiment and the experimental concepts.

BNL's theory group has made strong contributions to the physics of the LHC, neutrino physics, and lattice QCD.

Nuclear Physics (NP)

• The BNL nuclear physics group performs at a high level in all areas in mission accomplishment and merits a grade of A:

Impact of the RHIC in the area of research into hot, dense nuclear matter is deemed outstanding, as demonstrated by an impressive number of scientific measurements.

Significant contributions have been made to the STAR and PHENIX experiments that included continuing leadership responsibilities in maintaining detector and technical infrastructure and detector upgrades (e.g. Time-of-Flight, Forward Meson Detector, and the Hadron Blind Detector).

The nuclear theory effort has high impact in the programmatic area of hot, dense nuclear matter. The Lattice Quantum ChromoDynamics (LQCD) research group is recognized for world-class leadership in finite temperature LQCD.

Publication record is impressive in quantity and quality. BNL groups are principal authors on ~60% of refereed publications from RHIC data.

DOE and RHIC goals and milestones are largely met on time and within prevailing budgets.

National Nuclear Data Center (NNDC) provides visionary and effective leadership for the national nuclear data program to accomplish its mission.

The neutrino physics group (Chemistry) provides effective research and development of scintillators for planned neutrino experiments.

Workforce Development for Teachers and Scientists (WDTS)

• The Brookhaven National Laboratory's Office of Educational Programs does an excellent job in managing the WDTS programs. Their strength lies in the fact that the staff is singularly committed to ensuring that all WTDS participants have a quality laboratory research experience. All participants are fully integrated into the BNL laboratory culture and become part of the BNL "family". All program deliverables (research abstracts, full length papers, posters, portfolios) are of the highest quality and validate a significant achievement for research interns and educators. The education program office has positioned itself as a central contributor to the laboratory operation. Mentor researchers look to the education office for competent, much needed research support.



| Science Program Office | Letter Grade | Numerical Score | Objective Weight | Weighted Score | Overall Score | | |
|--|-----------------|--------------------|---------------------|-------------------|------------------|--|--|
| Office of Advanced Scientific Computing | Graue | Score | weight | Score | Score | | |
| Research | | | | | | | |
| 1.1 Impact | B+ | 3.1 | 40% | 1.24 | | | |
| 1.2 Leadership | B+ | 3.1 | 30% | 0.93 | | | |
| 1.3 Output | B+ | 3.1 | 15% | 0.47 | | | |
| 1.4 Delivery | B+ | 3.1 | 15% | 0.47 | | | |
| Total | | | | | | | |
| Office of Basic Energy Sciences | | | | | | | |
| 1.1 Impact | A | 3.8 | 50% | 1.90 | | | |
| 1.2 Leadership | A- | 3.6 | 20% | 0.72 | | | |
| 1.3 Output | A- | 3.6 | 15% | 0.54 | | | |
| 1.4 Delivery | A- | 3.6 | 15% | 0.54 | | | |
| | | | | Total | 3.70 | | |
| Office of Biological and Environmental Research | | | | | | | |
| 1.1 Impact | A- | 3.5 | 30% | 1.05 | | | |
| 1.2 Leadership | B+ | 3.3 | 20% | 0.66 | | | |
| 1.3 Output | A- | 3.5 | 20% | 0.70 | | | |
| 1.4 Delivery | B+ | 3.3 | 30% | 0.99 | | | |
| · | | | | Total | 3.40 | | |
| Office of High Energy Physics | | | | | | | |
| 1.1 Impact | B+ | 3.4 | 30% | 1.02 | | | |
| 1.2 Leadership | B+ | 3.4 | 30% | 1.02 | | | |
| 1.3 Output | B+ | 3.4 | 30% | 1.02 | | | |
| 1.4 Delivery | B+ | 3.3 | 10% | 0.33 | | | |
| · | | | | Total | 3.39 | | |
| Office of Nuclear Physics | | | | | | | |
| 1.1 Impact | A+ | 4.1 | 35% | 1.44 | | | |
| 1.2 Leadership | A | 4.0 | 25% | 1.00 | | | |
| 1.3 Output | A | 4.0 | 25% | 1.00 | | | |
| 1.4 Delivery | A- | 3.6 | 15% | 0.54 | | | |
| · | | • | • | Total | 3.98 | | |
| Office of Workforce Development | | | | | | | |
| 1.1 Impact | A | 3.8 | 25% | 0.95 | | | |
| 1.2 Leadership | A | 3.8 | 30% | 1.14 | | | |
| 1.3 Output | A | 3.8 | 30% | 1.14 | | | |
| 1.4 Delivery | A | 3.8 | 15% | 0.57 | | | |
| | | | | Total | 3.80 | | |

Table 1.1 – 1.0 SC Program Office Performance Goal Score Development



| Science Program Office | Letter | Numerical | BA | Weighted | Overall | | | |
|---|--------------------------|-----------|--------|----------|---------|--|--|--|
| | Grade | Score | Weight | Score | Score | | | |
| Office of Advanced Scientific Computing | | | | | | | | |
| Research | B+ | 3.10 | 0.4% | 0.01 | | | | |
| Office of Basic Energy Sciences | A- | 3.70 | 25.4% | 0.94 | | | | |
| Office of Biological and Environmental | | | | | | | | |
| Research | B+ | 3.40 | 6.2% | 0.21 | | | | |
| Office of High Energy Physics | B+ | 3.39 | 11.5% | 0.39 | | | | |
| Office of Nuclear Physics | A | 3.98 | 41.8% | 1.66 | | | | |
| Office of Workforce Development | A | 3.80 | 0.2% | 0.01 | | | | |
| | Performance Goal 1 Total | | | | | | | |

Table 1.2 – SC Program Office Overall Performance Goal Score Development

| HQ Program Office | Letter | Numerical | Objective | Weighted | Overall |
|---|--------|-----------|-----------|----------|---------|
| | Grade | Score | Weight | Score | Score |
| Energy Efficiency and Renewable Energy | | | | | |
| 1.1 Impact | A- | 3.7 | 25% | 0.93 | |
| 1.2 Leadership | A- | 3.7 | 25% | 0.93 | |
| 1.3 Output | A- | 3.7 | 25% | 0.93 | |
| 1.4 Delivery | A- | 3.7 | 25% | 0.93 | |
| | | | | Total | 3.70 |
| National Nuclear Security Administration | | | | | |
| 1.1 Impact | A | 4.0 | 25% | 1.00 | |
| 1.2 Leadership | A | 4.0 | 25% | 1.00 | |
| 1.3 Output | A | 4.0 | 25% | 1.00 | |
| 1.4 Delivery | A- | 3.6 | 25% | 0.90 | |
| | | | | Total | 3.90 |
| Department of Homeland Security | | | | | |
| 1.1 Impact | A | 4.0 | 25% | 1.00 | |
| 1.2 Leadership | A | 4.0 | 25% | 1.00 | |
| 1.3 Output | A+ | 4.2 | 25% | 1.05 | |
| 1.4 Delivery | A | 3.9 | 25% | 0.98 | |
| | | | | Total | 4.03 |

Table 1.3 - Other Program Office Performance Goal Score Development

| HQ Program Office | Letter | Numerical | BA | Weighted | Overall | |
|---|--------|-----------|--------|----------|---------|--|
| | Grade | Score | Weight | Score | Score | |
| Office of Science | A | 3.77 | 85.4% | 3.22 | | |
| Energy Efficiency and Renewable Energy | A- | 3.70 | 1.4% | 0.05 | | |
| National Nuclear Security Administration | A | 3.90 | 13.0% | 0.51 | | |
| Department of Homeland Security | A | 4.03 | 0.2% | 0.01 | | |
| Performance Goal 1.0 Total | | | | | | |

Table 1.4 – Overall Performance Goal Score Development

| Total Score | 4.3-4.1 | 4.0-3.8 | 3.7-3.5 | 3.4-3.1 | 3.0-2.8 | 2.7-2.5 | 2.4-2.1 | 2.0-1.8 | 1.7-1.1 | 1.0-0.8 | 0.7-0 |
|----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-------|
| Final Grade | A+ | A | A- | B+ | В | B- | C+ | C | C- | D | F |

Table 1.5 – 1.0 Goal Final Letter Grade



2.0 Provide for Efficient and Effective Design, Fabrication, Construction and Operations of Facilities

The Contractor provides effective and efficient strategic planning; fabrication, construction and/or operations of Laboratory facilities; and is responsive to the user community.

The weight of this Goal is 37%.

The Provide for Efficient and Effective Design, Fabrication, Construction and Operations of Research Facilities Goal measures the overall effectiveness and performance of the Contractor in planning for and delivering leading-edge specialty research and/or user facilities to ensure the required capabilities are present to meet today's and tomorrow's complex challenges. It also measured the Contractor's innovative operational and programmatic means for implementation of systems that ensures the availability, reliability, and efficiency of these facilities; and the appropriate balance between R&D and user support.

Objectives:

- 2.1 Provide Effective Facility Design(s) as Required to Support Laboratory Programs
- 2.2 Provide for the Effective and Efficient Construction of Facilities and/or Fabrication of Components
- 2.3 Provide Efficient and Effective Operation of Facilities
- 2.4 Utilization of Facility to Grow and Support Lab's Research Base and External User Community

SC's assessments of the Goal and related Objectives are summarized below. See Appendix 1 for the Program Offices' detailed evaluations.

Basic Energy Sciences (BES)

• The National Synchrotron Light Source (NSLS) continues as a highly productive user facility. Construction of the Center for Functional Nanomaterials was successfully completed. Design of the NSLS-II facility has made excellent progress.

Biological and Environmental Research (BER)

• The protein crystallography program at the NSLS serves a large community of users, making use of a novel and efficient sample mail-in program that provides an especially noteworthy way to maximize use of the NSLS.

The protein crystallography program at the NSLS has attracted an outstanding exter-nal user community, equal to that of many better equipped, more modern synchrotrons. However, this outstanding program has had only modest effect on the biological research base at the laboratory.

High Energy Physics (HEP)

• The only current fabrication project being undertaken by BNL for HEP is the Daya Bay Reactor Experiment. It is currently on schedule and within budget.

Nuclear Physics (NP)

• The BNL nuclear physics group performs at a high level in all areas of design, fabrication, and operation of research facilities and merits a grade of A+:

Delivery of RHIC heavy ion beams to experiments significantly exceeded expectations.

CA-D staff continues to develop beams for the future research program.



Research and development of stochastic cooling will lead to a cost effective luminosity upgrade.

| Science Program Office | Letter Grade | Numerical Score | Objective Weight | Weighted Score | Overall Score |
|--|-----------------|--------------------|---------------------|-------------------|------------------|
| Office of Basic Energy Sciences | | | | | |
| 2.1 Effective Facility Designs | A | 4.0 | 30% | 1.20 | |
| 2.2 Construction/Fabrication | A | 4.0 | 20% | 0.80 | |
| 2.3 Operation of Facilities | A | 4.0 | 40% | 1.60 | |
| 2.4 Support Research Base | A | 3.9 | 10% | 0.39 | |
| | | | | Total | 3.99 |
| Office of Biological and Environmental Research | | | | | |
| 2.1 Effective Facility Designs | | | 0% | 0.00 | |
| 2.2 Construction/Fabrication | | | 0% | 0.00 | |
| 2.3 Operation of Facilities | A | 3.8 | 90% | 3.42 | |
| 2.4 Support Research Base | В | 2.9 | 10% | 0.29 | |
| | | | | Total | 3.71 |
| Office of High Energy Physics | | | | | |
| 2.1 Effective Facility Designs | B+ | 3.4 | 50% | 1.70 | |
| 2.2 Construction/Fabrication | B+ | 3.4 | 50% | 1.70 | |
| 2.3 Operation of Facilities | | | 0% | 0.00 | |
| 2.4 Support Research Base | | | 0% | 0.00 | |
| | | | | Total | 3.40 |
| Office of Nuclear Physics | | | | | |
| 2.1 Effective Facility Designs | | | 0% | 0.00 | |
| 2.2 Construction/Fabrication | | | 0% | 0.00 | |
| 2.3 Operation of Facilities | A+ | 4.2 | 85% | 3.57 | |
| 2.4 Support Research Base | B+ | 3.4 | 15% | 0.51 | |
| | | | | Total | 4.08 |

Table 2.1 – 2.0 SC Program Office Performance Goal Score Development

| Science Program Office | Letter | Numerical | BA | Weighted | Overall | | | |
|--|--------|-----------|--------|----------|---------|--|--|--|
| | Grade | Score | Weight | Score | Score | | | |
| Office of Basic Energy Sciences | A | 3.99 | 44.1% | 1.76 | | | | |
| Office of Biological and Environmental | | | | | | | | |
| Research | A- | 3.71 | 3.2% | 0.12 | | | | |
| Office of High Energy Physics | B+ | 3.40 | 9.0% | 0.31 | | | | |
| Office of Nuclear Physics | A+ | 4.08 | 43.6% | 1.78 | | | | |
| Performance Goal 2 Total | | | | | | | | |

Table 2.2 – SC Program Office Overall Performance Goal Score Development

| HQ Program Office | Letter | Numerical | BA | Weighted | Overall | | |
|--------------------------|--------|-----------|--------|----------|---------|--|--|
| | Grade | Score | Weight | Score | Score | | |
| Office of Science | A | 3.97 | 100.0% | 3.97 | | | |
| Performance Goal 2 Total | | | | | | | |

Table 2.3 – Overall Performance Goal Score Development



| Total Score | 4.3-4.1 | 4.0-3.8 | 3.7-3.5 | 3.4-3.1 | 3.0-2.8 | 2.7-2.5 | 2.4-2.1 | 2.0-1.8 | 1.7-1.1 | 1.0-0.8 | 0.7-0 |
|----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-------|
| Final Grade | A+ | A | A- | B+ | В | B- | C+ | C | C- | D | F |

Table 2.4 – 2.0 Goal Final Letter Grade



3.0 Provide Effective and Efficient Science and Technology Research Project/Program Management

The Contractor provides effective program vision and leadership; strategic planning and development of initiatives; recruits and retains a quality scientific workforce; and provides outstanding research processes, which improve research productivity.

The weight of this Goal is 25%.

The Provide Effective and Efficient Science and Technology Research Project/Program Management Goal measured the Contractor's overall leadership in executing S&T programs. Dimensions of program management covered included: 1) providing key competencies to support research programs to include key staffing requirements; 2) providing quality research plans that take into account technical risks and identify actions to mitigate risks; and 3) maintaining effective communications with customers to include providing quality responses to customer needs.

Objectives:

- 3.1 Provide Effective and Efficient Stewardship of Scientific Capabilities and Program Vision
- 3.2 Provide Effective and Efficient Science and Technology Project/Program Planning and Management
- 3.3 Provide Efficient and Effective Communications and Responsiveness to Customer Needs

SC's assessments of the Goal and related Objectives are summarized below. See Appendix 1 for the Program Offices' detailed evaluations.

Advanced Scientific Computing Research (ASCR)

• BNL management has met expectations. Reports have been on time and useful. Communications have improved and ASCR hopes that BNL will be able to attract researchers who will be more successful in ASCR competitions.

Basic Energy Sciences (BES)

• BNL has effectively used core strengths to respond to BES solicitations and delivered high quality scientific programs that fulfill the DOE mission needs; lack of diversity in the materials research programs continues to be a concern. Management and stewardship of scientific user facilities are excellent.

Biological and Environmental Research (BER)

• BNL has provided effective vision and leadership for its programs in climate, radiochemistry and instrumentation, and structural biology.

BNL management has maintained good communication with BER staff in its climate, radiochemistry and instrumentation, and structural biology programs but poor communication in its programs related to the Genomics: GTL program.

BNL has exhibited sustained world leadership in its medical research program. A significant challenge will be for BNL to develop and maintain new leadership capabilities as it makes the transition from medically-focused radiochemistry and instrumentation to a focus on energy and environmental needs.

High Energy Physics (HEP)

• BNL has been well-aligned with national priorities. They participate at a high level in the ATLAS experiment at the LHC one of the field's highest priorities. They have reoriented their program in muon and kaon physics towards neutrinos which are increasingly important to the



field. The lab stepped in the help provide critical scientific manpower for the Daya Bay Project with LBNL, and they have been important to planning a long-baseline neutrino program in collaboration with FNAL.

Management of the ATLAS operations program could be stronger. There have been planning failures such as the failure to anticipate the need for additional computing infrastructure. A well know fact the overhead rate on the operation program would increase was not dealt with until the last moment. The ATLAS upgrade proposal was unrealistic, since it did not justify the desired start time. There was problem with power supplies for ATLAS produced by a subcontractor, MDI. BNL corrected the technical problem, but is now being sued by MDI for intellectual properties violations.

Planning on Daya Bay has been effective.

Communications with headquarters have generally met expectations.

Nuclear Physics (NP)

• The BNL nuclear physics group performs at a high level in all areas of science and technology program management and merits a grade of A-:

New leadership providing a vision for the RHIC program and initiating discussion of a future Electron-Ion Collider (EIC).

The RHIC mid-term plan of detector upgrades, luminosity upgrades and new beams remains meritorious.

Provides very effective stewardship and strategic management of the nuclear theory relevant to the RHIC physics program.

The NNDC leads the national nuclear data program effectively and has planned for succession to a new Director.

Management of detector upgrade projects continues to be a concern.

Workforce Development for Teachers and Scientists (WDTS)

• BNL's Office of Educational Program is a highly motivated well managed team that works continually to integrate science education and workforce development into the research mission of the laboratory. BNL has advanced the education culture within the laboratory by supplying a well prepared, dedicated pool of undergraduate interns and educators.



| Science Program Office | Letter | Numerical | Objective | Weighted | Overall |
|---|--------|-----------|-----------|----------|---------|
| | Grade | Score | Weight | Score | Score |
| Office of Advanced Scientific Computing Research | | | | | |
| 3.1 Effective/Efficient Stewardship | B+ | 3.1 | 30% | 0.93 | |
| 3.2 Project/Program Planning & Management | B+ | 3.1 | 40% | 1.24 | |
| 3.3 Communications and Responsiveness | B+ | 3.1 | 30% | 0.93 | |
| | | | | Total | 3.10 |
| Office of Basic Energy Sciences | | | | | |
| 3.1 Effective/Efficient Stewardship | B+ | 3.4 | 40% | 1.36 | |
| 3.2 Project/Program Planning & Management | A- | 3.7 | 30% | 1.11 | |
| 3.3 Communications and Responsiveness | A | 3.9 | 30% | 1.17 | |
| | | | | Total | 3.64 |
| Office of Biological and Environmental Research | | | | | |
| 3.1 Effective/Efficient Stewardship | B+ | 3.1 | 20% | 0.62 | |
| 3.2 Project/Program Planning & Management | B+ | 3.1 | 30% | 0.93 | |
| 3.3 Communications and Responsiveness | B+ | 3.1 | 50% | 1.55 | |
| | | | | Total | 3.10 |
| Office of High Energy Physics | | | | | |
| 3.1 Effective/Efficient Stewardship | A- | 3.5 | 40% | 1.40 | |
| 3.2 Project/Program Planning & Management | В | 2.9 | 40% | 1.16 | |
| 3.3 Communications and Responsiveness | B+ | 3.4 | 20% | 0.68 | |
| | | | | Total | 3.24 |
| Office of Nuclear Physics | | | | | |
| 3.1 Effective/Efficient Stewardship | A | 4.0 | 40% | 1.60 | |
| 3.2 Project/Program Planning & Management | В | 3.0 | 40% | 1.20 | |
| 3.3 Communications and Responsiveness | B+ | 3.4 | 20% | 0.68 | |
| | | | | Total | 3.48 |
| Office of Workforce Development | | | | | |
| 3.1 Effective/Efficient Stewardship | A | 3.8 | 20% | 0.76 | |
| 3.2 Project/Program Planning & Management | A | 3.8 | 40% | 1.52 | |
| 3.3 Communications and Responsiveness | A | 3.8 | 40% | 1.52 | |
| | | | | Total | 3.80 |

Table 3.1 – 3.0 SC Program Office Performance Goal Score Development

| Science Program Office | Letter Grade | Numerical Score | BA Weight | Weighted Score | Overall Score | | |
|---|-----------------|--------------------|--------------|-------------------|------------------|--|--|
| Office of Advanced Green Comments | Graue | Score | weight | Score | Score | | |
| Office of Advanced Scientific Computing | | | | | | | |
| Research | B+ | 3.10 | 0.1% | 0.00 | | | |
| Office of Basic Energy Sciences | A- | 3.64 | 26.2% | 0.95 | | | |
| Office of Biological and Environmental | | | | | | | |
| Research | B+ | 3.10 | 4.8% | 0.15 | | | |
| Office of High Energy Physics | B+ | 3.24 | 13.4% | 0.43 | | | |
| Office of Nuclear Physics | A- | 3.48 | 32.4% | 1.13 | | | |
| Office of Workforce Development | A | 3.80 | 0.2% | 0.01 | | | |
| Performance Goal 3 Total | | | | | | | |

Table 3.2 – SC Program Office Overall Performance Goal Score Development



| HQ Program Office | Letter | Numerical | Objective | Weighted | Overall |
|--|--------|-----------|-----------|----------|---------|
| | Grade | Score | Weight | Score | Score |
| Energy Efficiency and Renewable Energy | | | | | |
| 3.1 Effective/Efficient Stewardship | A | 3.9 | 34% | 1.33 | |
| 3.2 Project/Program Planning & | | | | | |
| Management | A- | 3.7 | 33% | 1.22 | |
| 3.3 Communications and Responsiveness | A- | 3.7 | 33% | 1.22 | |
| | | | | Total | 3.77 |
| National Nuclear Security Administration | | | | | |
| 3.1 Effective/Efficient Stewardship | A | 4.0 | 34% | 1.36 | |
| 3.2 Project/Program Planning & | | | | | |
| Management | A+ | 4.2 | 33% | 1.39 | |
| 3.3 Communications and Responsiveness | A+ | 4.1 | 33% | 1.35 | |
| | | | | Total | 4.10 |
| Department of Homeland Security | | | | | |
| 3.1 Effective/Efficient Stewardship | A+ | 4.2 | 34% | 1.43 | |
| 3.2 Project/Program Planning & | | | | | |
| Management | A+ | 4.1 | 33% | 1.35 | |
| 3.3 Communications and Responsiveness | A+ | 4.4 | 33% | 1.45 | |
| | | | | Total | 4.23 |

Table 3.3 – 3.0 Other Program Office & Customer Performance Goal Score Development

| HQ Program Office | Letter | Numerical | BA | Weighted | Overall | | |
|--|--------|-----------|--------|----------|---------|--|--|
| | Grade | Score | Weight | Score | Score | | |
| Office of Science | A- | 3.47 | 77.1% | 2.68 | | | |
| Energy Efficiency and Renewable Energy | A | 3.77 | 2.1% | 0.08 | | | |
| National Nuclear Security Administration | A+ | 4.10 | 20.2% | 0.83 | | | |
| Department of Homeland Security | A+ | 4.23 | 0.6% | 0.03 | | | |
| Performance Goal 3.0 Total | | | | | | | |

Table 3.4 – Overall Performance Goal Score Development

| Total Score | 4.3-4.1 | 4.0-3.8 | 3.7-3.5 | 3.4-3.1 | 3.0-2.8 | 2.7-2.5 | 2.4-2.1 | 2.0-1.8 | 1.7-1.1 | 1.0-0.8 | 0.7-0 |
|----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-------|
| Final Grade | A+ | A | A- | B+ | В | В- | C+ | C | C- | D | F |

Table 3.5 – 3.0 Goal Final Letter Grade



4.0 Provide Sound and Competent Leadership and Stewardship of the Laboratory

The Contractor's Leadership provides effective and efficient direction in strategic planning to meet the mission and vision of the overall Laboratory; is accountable and responsive to specific issues and needs when required; and corporate office leadership provides appropriate levels of resources and support for the overall success of the Laboratory.

The weight of this Goal is 25%.

The Provide Sound and Competent Leadership and Stewardship of the Laboratory Goal measured the Contractor's Leadership capabilities in leading the direction of the overall Laboratory. It also measured the responsiveness of the Contractor to issues and opportunities for continuous improvement and corporate office involvement/commitment to the overall success of the Laboratory.

BHSO's assessment of the Goal is noted in the respective Objectives.

4.1 Provide a Distinctive Vision for the Laboratory and an Effective Plan for Accomplishment of the Vision to Include Strong Partnerships Required to Carry Out those Plans

The Laboratory Director and his leadership team have developed sound 10 year laboratory and strategic plans which have been well received by the Office of Science (SC). Science and technology goals and infrastructure resource requirements are the basis for the FY09 strategic plan and annual laboratory plan. An independent review team found strategic planning to be effective and employees understand how their work contributes to the Laboratory's vision and plan. Organizational Business Plans are in various stages of maturity. Some excellent examples, within the Deputy Director for Operations organizations, were noted by a recent independent Performance Effectiveness Review Team. BSA met the Office of Science's expectation of developing a baseline of the Laboratory cost drivers. The Laboratory Director and his leadership team is supportive of the SC initiative to reduce the cost of doing business. BSA identified operations for savings and cost avoidances and implemented actions. However, BHSO had to exert significant effort to gain meaningful outcomes from the BSA baseline and action plans. Additional effort in FY 2009 will be required to respond to, communicate and deliver on SC's expectation of reducing the cost of doing business at BNL.

4.2 Provide for Responsive and Accountable Leadership throughout the Organization

BSA has strengthened the Laboratory management team with strategic hires and promotions, i.e., the Associate Laboratory Director for Basic Energy Sciences, the Assistant Laboratory Director for ESH&Q, the Director of the Property and Procurement Division; a Fiscal Officer, and numerous hires for the NSLS-II project.

BSA leadership attention to addressing long-term operational issues has resulted in tangible and continuing improvements in several areas including Project and Facility Management, Cyber Security, Emergency Management, Fire Protection, and the management of injuries at BNL. While there is still work to be done, BSA performance in Days Away, Restricted, or Transferred (DART) and Total Recordable Case (TRC) rates has improved in FY08, realizing over a 40% reduction from FY07 rates.

BSA has reorganized its Facilities & Operations directorate with well qualified staff and implemented a focused approach to facility planning and management. The Laboratory's management of projects has matured, aligns well with the Laboratory's strategic plans and Modernization Initiative, and supports the implementation of the Mission Readiness process at BNL. Measures and targets supporting mission readiness have been incorporated into the



FY09 PEMP. The Science Laboratory Infrastructure (SLI) projects milestones are being met and the program continues to show success and growth with the addition of new projects. Accomplishments include Critical Decision -2 (CD-2) approval for Renovate Science Laboratory Phase I (RSL-I), CD-1 approval for Interdisciplinary Science Building (ISB), and CD-0 approval for Renovate Science Labs Phase II (RSL-II), an FY 2010 new start. BSA has started an Institutional General Plant Project (IGPP) program a year ahead of schedule and also achieved certification of the contractor's Earned Value Management System (EVMS). Performance in facility management and maintenance met expectations set in the FY08 PEMP; Maintenance Investment Index (MII) and Deferred Maintenance Reduction (DMR) investment improved toward year's end.

BSA's leadership and close attention to cyber security at BNL drove significant performance improvements that have been acknowledged by the SC cyber community. Improved communication with BHSO and within the SC cyber community have contributed to the program's success and ability to respond to the continually changing set of expectations and requirements.

The Laboratory Director and Deputy Director for Science and Technology have taken a leadership role in nanosafety within the SC community through the National Laboratory Directors Council (NLDC), which is greatly contributing to a key SC initiative to establish effective and appropriate DOE policies in nanosafety. The leadership team's commitment to nanosafety resulted in the Laboratory's positive performance in the DOE Office of Health, Safety, and Security (HSS) nanosafety review.

Work-for-Others (WFO) sponsors, the NRC and NASA, rated BSA highly. Both the NRC and NASA expressed satisfaction with BSA's performance.

The Laboratory Director and his leadership team have strengthened relationships within the New York State government in an effort to ensure a long term, low cost electric power contract for BNL through the New York Power Authority (NYPA). Numerous productive meetings and discussions have taken place with the Empire State Development Corporation (ESDC) and the Governor's office. The team has also worked with the Long Island Power Authority (LIPA) and independent developers for the potential siting of a large (up to 50 MW) photovoltaic array at BNL. The array, if sited at BNL, may provide low cost power, or reduced rates to BNL, and also include a small portion of the array for BNL research. The team has also worked with the Stony Brook University (SBU) partner to access the first \$10M of the \$30M New York State contribution to the Joint Photon Sciences Institute (JPSI), an important component of the NSLS-II project.

An Office of Inspector General review gave BSA's FY06-08 financial statements clean audit opinions with several observations and one finding for improvement.

While there has been an increase in BSA management attention to reduce injuries, the injury rates are about twice the SC targets. The injury investigation and causal analysis associated with injuries has improved but more attention is needed by including lower level BSA managers and supervisors in the injury reviews to ensure effective corrective actions.

The number of litigation cases, and the cost of litigation and settlement, is a concern. BSA needs to manage issues more aggressively to prevent them from becoming law suits, and manage litigation effectively to reduce overall costs and reach favorable outcomes.

Procurement's decision to indemnify a sub-contracto related to ATLAS power supplies without DOE approval or coordination with BSA's legal staff has exposed BSA corporate to the risk of incurring litigation, settlement or judgment costs associated with the lawsuit that has been filed.

BSA's conference management process is not being followed consistently by all BNL departments. BHSO has had to expend considerable effort on conference attendance requests



that are submitted late, late changes to approved requests, and resolving one case of a sponsored conference being conducted without DOE approval.

BSA intervention in the Environmental Restoration Projects (ERP) could have been stronger. Substandard documentation prior to the HFBR Operational Readiness Review (ORR) has been an issue even though these issues were brought to the attention of BSA Management. As a result, the Project has suffered substantial delays and excessive cost overruns. There could also be improvements in coordination and planning for Environmental Restoration project-related communications especially in coordinating waste transportation communications for the rail shipments that resulted in unplanned delays and uncertainty late in the task planning.

4.3 Provide Efficient and Effective Corporate Office Support as Appropriate

The BSA partners, Stony Brook University (SBU) and Battelle Memorial Institute (BMI) have provided strong support to BNL. SBU has appointed a new Associate Vice President for BNL Affairs who is spending more time at BNL focused on activities and issues, and SBU's new Provost is also engaged in BNL issues. SBU and BNL are collaborating on energy related research and development. SBU has taken a lead role in developing the SBU-BNL-Cold Spring Harbor Laboratory research alliance initiated by the New York State Governor. SBU conducted the search for the director of the New York Center for Computational Sciences, located at the BNL NY Blue supercomputer, and arranged for non-DOE operating funding. SBU and BNL are sharing housing and libraries for researchers. SBU has established a Small Business Development Center at BNL. SBU is offering courses for BNL employees. SBU assisted BNL in allaying concerns of a Long Island community regarding rail shipment of contaminated soils from the BNL clean up to an out of state disposal site. BMI arranged a memorandum of understanding between BNL and INREL for research and development. BMI established two fuel cell CRADA's at BNL. BMI continues to support BNL operational issues and initiatives. SBU and BMI hosted the DOE HSS ISM Champions Conference at BNL. SBU and BMI have initiated a relationship with Technical Ventures Corporation, a non-profit, to help establish venture capitalist relations with BNL. SBU arranged access to the first \$10M of the \$30M New York State contribution to the Joint Photon Sciences Institute (JPSI), an important component of the NSLS-II project. Continued SBU support will be needed to ensure that the remaining \$20M is secured from the State for the project.

BSA has conducted a sound corporate assurance process, including a third party assessment that had positive results. Three of four BSA Board Risk Committees have interacted with BHSO.

| ELEMENT | Letter Grade | Numerical Score | Objective Weight | Total Points | Total Points |
|---|-----------------|--------------------|---------------------|-----------------|-----------------|
| 4.0 Effectiveness and Efficiency of | | | | | |
| Contractor Leadership and | | | | | |
| Stewardship | | | | | |
| 4.1 Provide a Distinctive Vision for the Laboratory and an Effective Plan for Accomplishment of the Vision to Include Strong Partnerships Required to Carry Out those Plans | A- | 3.7 | 30% | 1.11 | |
| 4.2 Provide for Responsive and Accountable Leadership throughout the Organization | A- | 3.5 | 40% | 1.40 | |
| 4.3 Provide Efficient and Effective Corporate Office Support as Appropriate | B+ | 3.4 | 30% | 1.02 | |
| | | Perform | mance Goal | 4.0 Total | 3.5 |

Table 4.1 – 4.0 Goal Performance Rating Development



| Total Score | 4.3-4.1 | 4.0-3.8 | 3.7-3.5 | 3.4-3.1 | 3.0-2.8 | 2.7-2.5 | 2.4-2.1 | 2.0-1.8 | 1.7-1.1 | 1.0-0.8 | 0.7-0 |
|----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-------|
| Final Grade | A+ | A | A- | B+ | В | B- | C+ | C | C- | D | F |

Table 4.2 – 4.0 Goal Final Letter Grade



5.0 Sustain Excellence and Enhance Effectiveness of Integrated Safety, Health, and Environmental Protection

The Contractor sustains and enhances the effectiveness of integrated safety, health and environmental protection through a strong and well deployed system.

The weight of this Goal is 20%.

The Sustain Excellence and Enhance Effectiveness of Integrated Safety, Health, and Environmental Protection Goal measured the Contractor's overall success in preventing worker injury and illness; implementation of ISM down through and across the organization; and providing effective and efficient waste management, minimization, and pollution prevention.

BHSO's assessment of the Goal is noted in the respective Objectives.

5.1 Provide a Work Environment that Protects Workers and the Environment

BSA performance in Days Away, Restricted, or Transferred (DART) and Total Recordable Case (TRC) rates has improved in FY08, realizing over a 40% reduction from FY07 rates. While there has been an increase in BSA management attention in FY08 to reduce injuries, the injury rates are about twice the SC targets. The injury investigation and causal analysis associated with injuries has improved but more attention is needed by including lower level BSA managers and supervisors in the injury reviews to ensure effective corrective actions.

BHSO is concerned about the BSA categorization and subsequent reporting of events and incidents. BSA has categorized some events/incidents (especially management concerns and near misses) at a lower level than described in the DOE Occurrence Reporting and Processing System (ORPS) directive, the BSA Significance Category BNL ((SCBNL)—below ORPS threshold) procedure, and BHSO expectations. BHSO is also concerned about the adequacy and effectiveness of corrective actions associated with ORPS and SCBNL events/incidents.

BSA causal analyses associated with BHSO oversight activity (e.g., assessments, surveillances, occurrence report reviews, etc.) findings have improved; but not uniformly across the Laboratory. An additional concern is that while BHSO has reviewed BSA documented causal analyses, BHSO needs to attend the meetings in which the causal analyses are developed to fully understand the process. Some BSA Departments/Divisions have not been inviting BHSO staff to attend these meetings after having been repeatedly requested to do so.

In the October 2008 Quarterly Performance Review presentation, EM BHSO cited radiological controls and conduct of operations as not maintaining a green level of safety performance throughout the fiscal year.

5.2 Provide Efficient and Effective Implementation of Integrated Safety, Health and Environment Management

For this objective, Targets 5.2.1.2, 5.2.1.5, 5.2.2.1 and 5.2.2.2 met expectations.

For target 5.2.1.1, BSA's Work Planning & Control Process is maturing and improvements have been observed. However, the deployment and implementation of the process is deficient in some areas. The concept of Worker Planned Work is not fully understood by all workers and work is being accomplished without fully evaluating the process prior to performing the work.

For target 5.2.1.3, BSA has implemented improvements to the Fire Protection Program. A significant effort was expended for the successful integration of DOE Fire Protection requirements into the NSLS II project, and development of the Strategic Fire Safety Plan.



However, implementation of some Fire Protection corrective actions identified in the Assessment Tracking System (ATS) are behind schedule.

BSA exceeded BHSO's expectation for the safety observation target 5.2.1.4. In addition to completing mid-year and year end performance reports, BSA exceeded by 3% the 90% goal established in each manager's performance plan for the number of documented safety observations.

5.3 Provide Efficient and Effective Waste Management, Minimization, and Pollution Prevention

All the targets under this objective were met and exceeded.

BSA's Pollution Prevention Program sponsored a community outreach Residential Energy Forum where speakers discussed residential energy options and answered questions. BSA's Pollution Prevention Program was recognized with a DOE Pollution Prevention Award, the Office of Science "Best in Class" award for authorized release of sewage sludge to a Subtitle D landfill.

BSA's progress was noteworthy in reducing BNL's radiological footprint with the reduction of unneeded materials and chemicals, disposal of moratorium scrap metals, hot cell clean-out, and sealed source disposal/recycling.

BSA exceeded expectations by adding energy related objectives and targets into their Environmental Management System (EMS), winning a Long Island Commuter Choice Program Award for efforts to reduce vehicular air pollution, conducting the lab-wide Energy Challenge to encourage energy reduction, and providing assistance in siting a proposed photovoltaic power station.

| ELEMENT | Letter Grade | Numerical Score | Objective Weight | Total Points | Total Points | | | |
|--|-----------------|--------------------|---------------------|-----------------|-----------------|--|--|--|
| 5.0 Sustain Excellence and Enhance Effectiveness of Integrated Safety, Health, and Environmental Protection | | | | | | | | |
| 5.1 Provide a Work Environment that Protects Workers and the Environment | C+ | 2.1 | 20% | .42 | | | | |
| 5.2 Provide Efficient and Effective Implementation of Integrated Safety, Health and Environment Management | B+ | 3.2 | 60% | 1.92 | | | | |
| 5.3 Provide Efficient and Effective Waste Management, Minimization, and Pollution Prevention | A | 3.9 | 20% | .78 | | | | |
| Performance Goal 5.0 Total | | | | | | | | |

Table 5.1 – 5.0 Goal Performance Rating Development

| Total Score | 4.3-4.1 | 4.0-3.8 | 3.7-3.5 | 3.4-3.1 | 3.0-2.8 | 2.7-2.5 | 2.4-2.1 | 2.0-1.8 | 1.7-1.1 | 1.0-0.8 | 0.7-0 |
|----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-------|
| Final Grade | A+ | A | A- | B+ | В | B- | C+ | С | C- | D | F |

Table 5.2 – 5.0 Goal Final Letter Grade



6.0 Deliver Efficient, Effective, and Responsive Business Systems and Resources that Enable the Successful Achievement of the Laboratory Mission(s)

The Contractor sustains and enhances core business systems that provide efficient and effective support to Laboratory programs and its mission(s).

The weight of this Goal is 20%.

The Provide Business Systems that Efficiently and Effectively Support the Overall Mission of the Laboratory Goal measured the Contractor's overall success in deploying, implementing, and improving integrated business system that efficiently and effectively support the mission(s) of the Laboratory.

BHSO's assessment of the Goal is noted in the respective Objectives.

6.1 Provide an Efficient, Effective, and Responsive Financial Management System(s)

BSA obtained a clean (unqualified) opinion for the Laboratory Financial Statements for FY's 2004 to 2007 from the Office of Inspector General (OIG) with only a general cautionary observation and a finding related to procurement policy. The results of the Hackett benchmarking exercise was very encouraging in that it disclosed that BSA's financial system has characteristics found in world-class industrial organizations. There were instances of financial system internal control weaknesses that occurred which cause DOE concern. In particular, the Inspector General audit of proprietary users facilities disclosed BSA's lack of compliance with the DOE requirement for obtaining cash advances. A BHSO follow-up review found that BSA continued to have instances of non-compliance. In addition, a follow-up review by BHSO to an OIG Audit of Conference Management disclosed instances of noncompliance with DOE Requirements with respect to the accounting for conference provided meals on BSA employee travel vouchers. Also, the disclosure of the theft of cash from the Laboratory's Cashier operations resulted in the need for strengthening of internal controls.

BSA produces a letter of financial assurance annually as required under the Federal Manager's Financial Integrity Act. The FY 2008 letter was not as robust or as candid as it should have been. The letter was limited to discussion of only positive aspects of the financial system and did not discuss vulnerabilities (i.e. loss of property or cash) nor actions put in place to strengthen controls. Overall, the financial system is functioning acceptably, however, based on BHSO's financial assessments, there are areas where internal controls need to be strengthened.

6.2 Provide an Efficient, Effective, and Responsive Acquisition and Property Management System(s)

Although the procurement Balanced Scorecard (BSC) data was received timely this year, the results were disappointing. Only 13 of the 20 BSC measures met or exceeded expectations. Several measures produced results that were at lower performance levels than previous years. Additionally, there were concerns with several procurements.

The new Procurement and Property Management (PPM) Director has had a very positive impact upon resolving outstanding issues, focusing on compliance and communicating well with BHSO. However, the failure to acquire/retain appropriate personnel early in the year had a negative impact upon the effectiveness of the system as detailed in the BSC report. Many problem areas can be attributed to either a lack of personnel, lack of trained personnel or failure to implement initiatives as planned. Concerns encountered with the NSLS-II Ring Building RFP, inappropriate acceptance of indemnity provisions and cost issues with the BGRR Firm Fixed Price (FFP) subcontract continue to present challenges that need high-level management attention. The new PPM director needs to receive the support necessary to implement initiatives and corrective actions that will improve the effectiveness of the procurement process and as a result, mitigate the exposure to litigation and non-compliances and/or findings. It is also imperative that BSA continues to support the PPM Manager in his efforts to fill/refill the remaining staffing positions as the major procurements for the NSLS-II project intensify in 2009.



Property Management (PM) is improving its use of information technology for all sales. This was demonstrated during FY 2008 as 100% of all sales used the On-line Sale (Bid-for-Assets). They also exceeded expectations by achieving 100% accountability of 25 subcontractors holding government furnished property. This was a challenge in previous years due to poor inventory controls. Additionally, the learning and growth requirement for their key staff exceeded the FY 2008 expectation which included PM Certifications, and supervisory level training. Also, PM surpassed customer satisfaction target ratings of both internal (BNL) and external (DOE) customers by achieving a combined rating of 99%. However, there is room for improvement relative to the accountability and control of Laptop computers.

6.3 Provide an Efficient, Effective, and Responsive Human Resources Management System

BSA took several proactive actions to continue to contain the rising costs of employee benefits. Of particular note was the decision to compete the Laboratory's extraordinary medical claims insurance. By competing that insurance, BSA avoided a premium increase of \$18% (\$80,000) annually. Also, the decision to compete BSA's benefits consulting firm resulted in improved services and cost savings as well (\$120,000).

BSA designated 9 open positions as strategic to achieving BNL's mission. Of the 9, only five were filled during the rating period. It should be noted that the search process for 2 unfilled strategic positions are well advanced and that decisions are anticipated in FY 2009.

The scientific Departments developed organizational Business Plans and incorporated a diversity management component to their strategies for advancing human capital and achieving the organization's mission.

6.4 Provide Efficient, Effective, and Responsive Management Systems for Internal Audit and Oversight; Quality; Information Management; and Other Administrative Support Services as Appropriate.

BHSO observed more effective analyses of the BNL Events/Issues Management Subject Area from surveillances and assessments performed. However, BHSO also observed the need for improvements including the lack of notes in the Event/Issue logs and instances of informality of event investigation critiques.

Although Internal Audit did not identify any material weaknesses in their audit reports when BHSO and the Chicago Office performed some limited scope assessments of BSA's financial systems, instances of control weaknesses were identified. For example, instances of noncompliance with DOE cash advance requirements were observed. Particularly troubling with this issue was that the Office of Inspector General had recently concluded an audit involving cash advances and corrective actions were expected to be put in place. BHSO's follow-up review found that the controls were not in place or were not effective. During the rating period, a theft of cash was reported from BSA's petty cash operations. While it was believed that the financial internal controls disclosed the fraud, it became apparent that many months had passed before the crime was uncovered.

In order to assess the overall success of BNL's information technology function, BSA conducted an effectiveness survey of the business support enterprise system. The survey was widely distributed among laboratory business system users and a substantial number of responses were received (179, 44%). The system was rated responsive (90%) and reliable (88%). BSA is adequately addressing process improvement suggestions that were provided as part of the survey.

6.5 Demonstrate Effective Transfer of Technology and Commercialization of Intellectual Assets

The Technology Transfer program has improved during the performance period. BSA is engaging more with the DOE technology transfer community. For example, BSA recently hosted a meeting of Office of Science Federal Laboratories Consortium (FLC) participants. BSA has become an active member of the DOE Tech Transfer Working Group which was established by Dr. Orbach. BSA was



selected to be part of the DOE Entrepreneur in Residence program. SUNY Stony Brook and Laboratory management have engaged in discussions to re-establish a Small Business Development Center presence at BNL. Through the SBDC's counseling and other services, this activity should benefit BNL in its overall efforts to transfer technology to the private sector. In FY 2008 BSA improved its tech-maturation program and made website improvements. BSA continues to demonstrate excellent results in the filing of patent applications and patent issuances. The number of licenses issued is sizable as well.

| ELEMENT | Letter Grade | Numerical Score | Objective Weight | Total Points | Total Points |
|---|-----------------|--------------------|---------------------|-----------------|-----------------|
| 6.0 Deliver Efficient, Effective, and Responsive Business Systems and Resources that Enable the Successful Achievement of the Laboratory Mission(s) | | | | | |
| 6.1 Provide an Efficient, Effective, and Responsive Financial Management System(s) | В | 2.9 | 30% | .87 | |
| 6.2 Provide an Efficient, Effective, and Responsive Acquisition and Property Management System(s) | В- | 2.6 | 25% | .65 | |
| 6.3 Provide an Efficient, Effective, and Responsive Human Resources Management System and Diversity Program | B+ | 3.3 | 20% | .66 | |
| 6.4 Provide Efficient, Effective, and Responsive Management Systems for Internal Audit and Oversight; Quality; Information Management; and Other Administrative Support Services as Appropriate | B+ | 3.2 | 15% | .48 | |
| 6.5 Demonstrate Effective Transfer of Technology and Commercialization of Intellectual Assets | B+ | 3.4 | 10% | .34 | |
| | | Perfor | mance Goal (| 5.0 Total | 3.0 |

Table 6.1 – 6.0 Goal Performance Rating Development

| Total Score | 4.3-4.1 | 4.0-3.8 | 3.7-3.5 | 3.4-3.1 | 3.0-2.8 | 2.7-2.5 | 2.4-2.1 | 2.0-1.8 | 1.7-1.1 | 1.0-0.8 | 0.7-0 |
|----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-------|
| Final Grade | A+ | A | A- | B+ | В | В- | C+ | C | C- | D | F |

Table 6.2 – 6.0 Goal Final Letter Grade



7.0 Sustain Excellence in Operating, Maintaining, and Renewing the Facility and Infrastructure Portfolio to Meet Laboratory Needs

The Contractor provides appropriate planning for, construction and management of Laboratory facilities and infrastructures required to efficiently and effectively carry out current and future S&T programs.

The weight of this Goal is 15%.

The Sustain Excellence in Operating, Maintaining, and Renewing the Facility and Infrastructure Portfolio to Meet Laboratory Needs Goal measured the overall effectiveness and performance of the Contractor in planning for, delivering, and operations of Laboratory facilities and equipment needed to ensure required capabilities are present to meet today's and tomorrow's complex challenges.

BHSO's assessment of the Goal is noted in the respective Objectives.

7.1 Manage Facilities and Infrastructure in an Efficient and Effective Manner that Optimizes Usage and Minimizes Life Cycle Costs

BSA has implemented a focused strategic approach to facility planning and management by reorganizing the Facility and Operation directorate and staffing with several highly competent professionals. BSA is implementing the Mission Readiness process, an SC initiative. BSA effectively implemented the Project, Planning, Programming and Budgeting (3PBP) process. BSA has exceeded the Deferred Maintenance Reduction (DMR) goal. The Activity Data Sheets (ADS) were supplemented with additional products such as the draft Fire Protection Strategic Plan and the Collider Accelerator Department's (CAD) Facility Consolidation Plan. BSA is moving toward sustainability-based budgeting to achieve space utilization and cost reduction. The Transformational Energy Action Management (TEAM) initiative is in place and a revised Energy Service Companies (ESCO) initial proposal is being reviewed and finalized.

There was a continuous degradation in the management of the EM Projects as indicated by the Environmental Restoration Projects' (ERP) Estimates to Complete (EAC). At the end of FY2008, EACs were forecasting a total Decontamination and Decommissioning (D&D) overrun approaching \$10 million on a \$47 million baseline, a 21 percent overrun. Management Reserve funding totals about \$5.7 million which is not enough to cover the overall forecasted costs.

7.2 Provide Planning for and Acquire the Facilities and Infrastructure Required to support Future Laboratory Programs

BSA received Earned Value Management System certification and critical decision (CD) approvals for the Renovate Science Labs II (CD-0), the Interdisciplinary Science Building I (CD-1), and the Renovate Science Labs I (CD-2). All line item Critical Decisions were achieved on schedule; however, a milestone related to Independent Project Review (IPR) preparations on the Renovate Science Labs was missed and the review resulted in numerous recommendations that were required to be corrected prior to CD-2 approval. The new Materials Handling Facility was completed on schedule to support the NSLS-II Project

BSA devoted significant management resources to support the renegotiation of the New York Power Authority (NYPA) contract and facilitated a one-year extension with favorable rates. BSA's Annual Plan, which incorporated the Ten Year Site Plan, was well received by SC. BSA has also started implementing the Mission Readiness approach, an SC initiative, to infrastructure planning and started its Institutional General Project Plan (IGPP) program one year ahead of schedule.



| ELEMENT | Letter Grade | Numerical Score | Objective Weight | Total Points | Total Points | | | |
|---|-----------------|--------------------|---------------------|-----------------|-----------------|--|--|--|
| 7.0 Sustain Excellence in Operating, Maintaining, and Renewing the Facility and Infrastructure Portfolio to Meet Laboratory Needs | | | | | | | | |
| 7.1 Manage Facilities and Infrastructure in an Efficient and Effective Manner that Optimizes Usage and Minimizes Life Cycle Costs | B+ | 3.4 | 50% | 1.70 | | | | |
| 7.2 Provide Planning for and Acquire the Facilities and Infrastructure Required to support Future Laboratory Programs | B+ | 3.4 | 50% | 1.70 | | | | |
| Performance Goal 7.0 Total | | | | | | | | |

Table 7.1 – 7.0 Goal Performance Rating Development

| Total Score | 4.3-4.1 | 4.0-3.8 | 3.7-3.5 | 3.4-3.1 | 3.0-2.8 | 2.7-2.5 | 2.4-2.1 | 2.0-1.8 | 1.7-1.1 | 1.0-0.8 | 0.7-0 |
|----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-------|
| Final Grade | A+ | A | A- | B+ | В | В- | C+ | C | C- | D | F |

Table 7.2 – 7.0 Goal Final Letter Grade



8.0 Sustain and Enhance the Effectiveness of Integrated Safeguards and Security Management (ISSM) and Emergency Management Systems

The Contractor sustains and enhances the effectiveness of integrated safeguards and security and emergency management through a strong and well deployed system.

The weight of this Goal is 20%.

The Sustain and Enhance the Effectiveness of Integrated Safeguards and Security Management (ISSM) and Emergency Management Systems Goal measured the Contractor's overall success in safeguarding and securing Laboratory assets that supports the mission(s) of the Laboratory in an efficient and effective manner and provides an effective emergency management program.

BHSO's assessment of the Goal is noted in the respective Objectives.

8.1 Provide an Efficient and Effective Emergency Management System

BSA made progress in improving emergency management processes and procedures. Two professional FTEs were hired in the Office of Emergency Management (OEM) and its budget was substantially increased to allow for sub-contractor support. However, several procedures and processes had not been implemented.

No BNL Operational Emergencies occurred in FY08. The BNL Police and Fire Rescue groups successfully reported, managed, and mitigated a significant number of lesser (i.e., non-Operational Emergency) events.

BSA expended a significant amount of effort to prepare for and host the HS-63 emergency management review. The results of this review, along with BHSO assessments, have demonstrated that improvement in BSA's emergency management system has occurred. However, some deficiencies and findings were identified and a continued effort will be required to bring the program into compliance with DOE requirements.

8.2 Provide an Efficient and Effective System for Cyber-Security

Improved BSA leadership and attention, as well as improved communication within BSA and with BHSO and the SC cyber community, has greatly contributed to the SC wide effort to promote accelerated communication of intrusion attempts across SC. This enhanced communication has increased SC cyber security effectiveness by promoting rapid identification of malicious efforts to penetrate SC cyber resources. BSA has been active in various cyber security working groups. While BSA efforts to close legacy Plans of Actions & Milestones (POAMS) issues were significant, several POAMS remain open with due dates as early as September 2006. No external cyber security reviews were conducted this FY.

8.3 Provide an Efficient and Effective System for the Protection of Special Nuclear Materials, Classified Matter, and Property

The BNL Safeguards and Security Division did not have any external reviews or inspections during FY08. However the remaining findings from the DOE Chicago Safeguards and Security inspection performed at the end of FY07 were satisfactorily closed. Given the challenges that BNL Safeguards and Security has had and is facing with respect to funding, the program continues to be proactive and progressive. The re-organization of Safeguards and Security is anticipated to produce a stronger organization to meet BNL's protection needs.



8.4 Provide an Efficient and Effective System for the Protection of Classified and Sensitive Information

The BNL Safeguards and Security program continues to demonstrate a strong system to protect classified and sensitive information. There were no reportable incidents involving classified or sensitive information and no evidence of programmatic failures.

BHSO expects an enhanced self-assessment program next year to assure the continuation of an effective program.

The BSA Counterintelligence Regional Office is operating effectively and successfully completed a program inspection. However, the program plan, required by the PEMP target, was not delivered to BSA and BHSO until after the end of the performance period.

| ELEMENT | Letter Grade | Numerical Score | Objective Weight | Total Points | Total Points | |
|---|-----------------|--------------------|---------------------|---------------------|-----------------|--|
| 8.0 Sustain and Enhance the | | | | | | |
| Effectiveness of Integrated | | | | | | |
| Safeguards and Security | | | | | | |
| Management (ISSM) and | | | | | | |
| Emergency Management Systems | | | | | | |
| 8.1 Provide an Efficient and Effective Emergency Management System | В | 2.8 | 35% | .98 | | |
| 8.2 Provide an Efficient and Effective System for Cyber-Security | B+ | 3.4 | 35% | 1.19 | | |
| 8.3 Provide an Efficient and Effective System for the Protection of Special Nuclear Materials, Classified Matter, and Property | A | 3.8 | 15% | .57 | | |
| 8.4 Provide an Efficient and Effective System for the Protection of Classified and Sensitive Information | A- | 3.6 | 15% | .54 | | |
| | | Perfor | mance Goal 8 | 35% 1.19 15% .57 | | |

Table 8.1 – 8.0 Goal Performance Rating Development

| Total Score | 4.3-4.1 | 4.0-3.8 | 3.7-3.5 | 3.4-3.1 | 3.0-2.8 | 2.7-2.5 | 2.4-2.1 | 2.0-1.8 | 1.7-1.1 | 1.0-0.8 | 0.7-0 |
|----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-------|
| Final Grade | A+ | A | A- | B+ | В | B- | C+ | С | C- | D | F |

Table 8.2 – 8.0 Goal Final Letter Grade



APPENDIX 1

Order of Program Office evaluations in this Appendix:

Advanced Scientific Computing Research

Basic Energy Sciences

Biological and Environmental Research

High Energy Physics

Nuclear Physics

Workforce Development for Teachers and Scientists



Advanced Scientific Computing Research Brookhaven National Laboratory FY 2008 Performance Evaluation Science and Technology

Goal 1.0: Provide for Efficient and Effective Mission Accomplishment.

Weight: 80%

Score: 3.10 Grade: B+

Goal Evaluation:

BNL continues to have very narrow participation in the ASCR program. BNL participates in only two SciDAC projects but lead one Climate SAP. Communications have improved and ASCR hopes that BNL will be more successful in future ASCR competitions.

Objective 1.1: Science and Technology Results Provide Meaningful Impact on the Field.

Weight: 40%

Score: 3.1 Grade: B+

Objective Evaluation:

BNL researchers are members of two SciDAC teams, leading one Climate SAP and provide strong contributions to those efforts. However, BNL's contributions are modest to the overall SciDAC project (as is their funding).

Objective 1.2: Provide Quality Leadership in Science and Technology.

Weight: 30%

Score: 3.1 Grade: B+

Objective Evaluation:

McGraw leads a SciDAC SAP (aerosol dynamics) attached to a major SciDAC Climate project (Earth Systems Model). However, this three year SAP ends in FY09 and continuation will require strong peer review comments with regard to SAP contributions in the review of the overarching project.

Objective 1.3: Provide and sustain Science and Technology Outputs that Advance Program Objectives and Goals.

Weight: 15%

Score: 3.1 Grade: B+

Objective Evaluation:

BNL's limited activities continue to make steady progress. Contributions are approximately commensurate with funding.

Objective 1.4: Provide for Effective Delivery of Products.



Weight: 15%

Score: 3.1 Grade: B+

Objective Evaluation:

BNL researchers publish in the open literature and release software under open source licenses.

Goal 2.0: Provide for Efficient and Effective Design, Fabrication, Construction and Operations of Research Facilities

Weight: N/A

Score: N/A Grade: N/A

Goal Evaluation:

N/A

Objective 2.1: Provide Effective Facility Design(s) as Required to Support Laboratory Programs.

**** * * * ****

Weight: N/A

Score: N/A Grade: N/A

Objective Evaluation:

N/A

Objective 2.2: Provide for the Effective and Efficient Construction of Facilities and/or Fabrication of Components.

Weight: N/A

Score: N/A Grade: N/A

Objective Evaluation:

N/A

Objective 2.3: Provide Efficient and Effective Operation of Facilities.

Weight: N/A

Score: N/A Grade: N/A

Objective Evaluation:

N/A

Objective 2.4: Utilization of Facility to Grow and Support Lab's Research Base and

External User Community.

Weight: N/A

Score: N/A Grade: N/A



Objective Evaluation:

N/A

Goal 3.0: Provide Effective and Efficient Science and Technology Program Management.

Weight: 20%

Score: 3.1 Grade: B+

Goal Evaluation:

BNL management has met expectations. Reports have been on time and useful. Communications have improved and ASCR hopes that BNL will be able to attract researchers who will be more successful in ASCR competitions.

Objective 3.1: Provide Effective and Efficient Stewardship of Scientific Capabilities and Program Vision.

Weight: 30%

Score: 3.1 Grade: B+

Objective Evaluation:

The program at BNL now consists of two relatively small efforts. They do not yet have a compelling vision for research in the ASCR space. However, communications have improved and ASCR hopes to see changes.

Objective 3.2: Provide Effective and Efficient Science and Technology Project/Program Planning and Management.

Weight: 40%

Score: 3.1 Grade: B+

Objective Evaluation:

BNL are clearly rethinking their efforts in advanced scientific computing and ASCR looks forward to continued productive discussions.

Objective 3.3: Provide Efficient and Effective Communications and Responsiveness to Customer Needs.

Weight: 30%

Score: 3.1 Grade: B+

Objective Evaluation:

Progress reports and FWPs are delivered in a timely fashion and are generally complete and accurate.



Basic Energy Sciences Brookhaven National Laboratory FY 2008 Performance Evaluation Science and Technology

Goal 1.0: Provide for Efficient and Effective Mission Accomplishment.

Weight: 30%

Score: 3.70 Grade: A-

Goal Evaluation:

Materials sciences research programs have demonstrated world leadership and sustained impact in superconductivity, photoemission spectroscopy, x-ray scattering and quantitative electron microscopy. Chemical sciences research programs have demonstrated sustained scientific progress and impact in the areas of thermal, photo-, and radiation-induced reactions, condensed media radiation sciences, electron transfer mechanisms, homogeneous photo-catalysis, and solar photoconversion.

Objective 1.1: Science and Technology Results Provide Meaningful Impact on the Field.

Weight: 50%

Score: 3.8 Grade: A

Objective Evaluation:

The BES Materials Science and Engineering (MSE) Division supported program at BNL was peer reviewed in FY 2008. The overall quality of the program was found to be excellent. Scientific programs in materials synthesis, correlated electron materials and superconductivity, and the emerging work in nano-material synthesis were judged as being world-class and highly relevant to the mission of the Department. The hiring of new highly regarded researchers through joint appointments with nearby major universities was viewed positively and was expected to lead to better incorporation of postdocs and students into the program. Various physical plant improvements throughout BNL complex have greatly benefitted the program and improved productivity. The restructuring of the Condensed Matter Physics and Materials Sciences Department since the last review strengthened the research focus and interactions among various projects. However, it was noted that there was room for further improvement in integrating the theory effort, both as an independent group and as a collaborative effort with other projects.

Two Hydrogen Fuel Initiative (HFI) projects supported through the BES Chemical Sciences, Geosciences, and Biosciences (CSGB) Division, one in band-gap modified semiconductors for solar hydrogen generation and the other in metal and metal oxide-supported platinum monolayer electrocatalysts for oxygen reduction, were renewed for another three-year funding period on the basis of strong merit reviews. Three new proposals were submitted to the CSGB Physical Biosciences core program; two reviewed strongly and were funded. The high success rate of these renewal and new proposals in a very competitive environment was indicative of their high quality.

Ongoing CSGB Division programs in Thermal, Photo-, and Radiation-Induced Chemistry; Catalysis; Chemical Physics; and Biosciences were not reviewed in FY 2008 but were generally quite strong, contained several world-class investigators, and continued to make excellent progress.

Objective 1.2: Provide Quality Leadership in Science and Technology.

Weight: 20%



Score: 3.6 Grade: A-

Objective Evaluation:

The majority of researchers supported by the MSE Division were recognized leaders in their respective fields as evidenced by the most recent program review in FY 2008. In the topical areas of superconductivity, magnetism, nano-materials synthesis, and instrumentation development, they are at the forefront, and overall the leadership position of the program was also strengthened by the hiring of new highly regarded researchers through joint appointments.

CSGB Division programs in Thermal, Photo-, and Radiation-Induced Chemistry; Catalysis; Chemical Physics; and Biosciences, were not reviewed in FY 2008; they have nationally and internationally recognized investigators.

Objective 1.3: Provide and sustain Outputs that Advance Program Objectives & Goals

Weight: 15%

Score: 3.6 Grade: A-

Objective Evaluation:

The activities supported by the MSE Division continued to produce a large number of excellent quality, peer reviewed journal articles. The program frequently reported research accomplishments.

Overall, the quantity and quality of research outputs in peer-reviewed journals for the programs supported by the CSGB Division were fully acceptable.

Objective 1.4: Provide for Effective Delivery of Products.

Weight: 15%

Score: 3.6 Grade: A-

Objective Evaluation:

The research activities supported by the MSE Division were effective in transmitting the results to the community through publications in high quality peer-reviewed journals and highlights submitted to BES. BNL management for the materials research program was very responsive to BES requests.

CSGB Division supported research programs were effective and efficient in meeting scientific objectives and milestones, as measured by peer review. The programs were responsive to requests from BES for information and research highlights.

Goal 2.0: Provide for Efficient and Effective Design, Fabrication, Construction and Operations of Research Facilities

Weight: 50%

Score: 3.99 Grade: A

Goal Evaluation:



The National Synchrotron Light Source (NSLS) continues as a highly productive user facility. Construction of the Center for Functional Nanomaterials was successfully completed. Design of the NSLS-II facility has made excellent progress.

Objective 2.1: Provide Effective Facility Design(s) as Required to Support Laboratory Programs.

Weight: 30%

Score: 4.0 Grade: A

Objective Evaluation:

The contractor made outstanding progress in FY 2008, despite a funding shortfall for NSLS-II. In early FY 2008, the NSLS-II project defended its baseline to review groups convened by the Department's Office of Project Assessment (OPA) and Office of Engineering and Construction Management (OECM). As a result of these reviews, the project achieved CD-2 in January 2008. By the end of the FY, the ring building Title II design was 100% complete, and Brookhaven Science Associates (BSA) garnered OECM certification of its Earned Value Management System (EVMS).

Via a memorandum of understanding with SLAC, BNL played a significant role in detector development for the LUSI project. This cutting-edge work progressed well, and was presented at FY 2008 reviews (at BNL in April and at SLAC in August) for reviewer commentary, which was favorable.

Objective 2.2: Provide for the Effective and Efficient Construction of Facilities and/or Fabrication of Components.

Weight: 20%

Score: 4.0 Grade: A

Objective Evaluation:

The construction of the Center for Functional Nanomaterials (CFN) project was successfully completed in FY 2008, within cost and on schedule, and with attainment of its CD-4b milestone in March 2008. It also attained a Leadership in Energy and Environmental Design (LEED) Silver certification recognizing its Green design and a positive impact on public health and the environment, reduced operating costs, and potential for increased occupant productivity.

Objective 2.3: Provide Efficient and Effective Operation of Facilities.

Weight: 40%

Score: 4.0 Grade: A

Objective Evaluation:

The National Synchrotron Light Source (NSLS) operated the VUV and X-ray Storage Rings with high reliability (97.4% and 92.9%, respectively), with a total of 2128 unique users. The BES Scientific User Facility Division held a triennial operations review of the NSLS on April 30-May 2, 2008. The NSLS made significant improvements with respect to the last review in 2005. NSLS scientific productivity was maintained in terms of its high impact publications. NSLS management fully engaged the user community, staff, and its Scientific Advisory Committee in developing a 5-year strategic plan. Staff morale was improved.



The CFN received initial operational funding at the start of FY 2008, with full operations commencing after completion of the project in March 2008. It continued to transition from project completion into user facility operations over the remainder of FY 2008, doing so effectively as evidenced by reported users and its initial operations review in May 2008.

Objective 2.4: Utilization of Facility to Grow and Support Lab's Research Base and External User Community.

Weight: 10%

Score: 3.9 Grade: A

Objective Evaluation:

The contractor of the NSLS-II project made several strategic hires in its senior management and conducted several user outreach workshops associated with beamline development. These activities resulted in the hiring of high-quality scientists and engineers, and growth of the prospective user community's inputs into defining future beamline capabilities.

The NSLS was a key facility for the BNL programmatic research divisions and for the staff of the CFN. With the start of CFN operation, both facilities were important for the characterization of nanomaterials. The CFN progressed well towards establishing itself as a major user facility, as supported by the results of its initial (baseline) operations review in April 2008. Scientific quality and enthusiasm were very high, and progression towards a steady-state operations mode was well underway. The primary recommendations from the review involved appropriately competing the large majority of time available, which will require facility staff to submit proposals if they require use of more than a small fraction of the time available for their own research, and development of a strategic plan and corresponding priorities to maintain focus and develop synergies among staff research areas. Outreach to the external user community has been substantial but will need further effort to broaden the user pool.

Goal 3.0: Provide Effective and Efficient Science and Technology Program Management.

Weight: 20%

Score: 3.64 Grade: A-

Goal Evaluation:

BNL has effectively used core strengths to respond to BES solicitations and delivered high quality scientific programs that fulfill the DOE mission needs; lack of diversity in the materials research programs continues to be a concern. Management and stewardship of scientific user facilities are excellent.

Objective 3.1: Provide Effective and Efficient Stewardship of Scientific Capabilities and Program Vision.

Weight: 40%

Score: 3.4 Grade: B+

Objective Evaluation:

BNL is a recognized leader in correlated electron materials and x-ray and neutron scattering science and instrumentation. Their recent strategic hires should continue to raise the quality and visibility of the overall program. Their new hires in synthesis and superconductivity continued to strengthen the laboratory's scientific core competencies. Continued management attention is needed to address the lack of diversity of the scientific staff, especially women and



underrepresented groups, and was noted in the guidance letter following the FY 2008 on-site review.

New staffs in the BNL Chemistry and Biology Departments were making important contributions to CSGB Division supported programs.

Objective 3.2: Provide Effective and Efficient Science and Technology Project/Program Planning and Management

Weight: 30%

Score: 3.7 Grade: A-

Objective Evaluation:

BNL continued to improve its project planning and management of the programs funded by the MSE Division as exhibited by enhanced synergies among field work proposals and effective use of unique tools available at facilities supported by the SUFD, e.g., NSLS, CFN, and NSLS-II. The Director of the BNL Chemistry Department effectively defined clear and logical strategic plans for research programs within his purview and communicated those plans in an articulate manner to the CSGB Division in the FY 2008 management review. The management of the BNL Biology department continued commendable efforts to establish and implement research programs in the developing biosciences portfolio in the CSGB Division.

Objective 3.3: Provide Efficient and Effective Communications and Responsiveness to Customer Needs.

Weight: 30%

Score: 3.9 Grade: A

Objective Evaluation:

Management of the programs supported by the MSE Division was effective with frequent communications along properly defined management lines and was responsive to BES management.

Communications between the CSGB Division and the management of both the BNL Chemistry and Biology Departments remained thorough and timely in FY 2008. BNL management was very responsiveness, assisting in providing a detailee to the BES Gas-Phase Chemical Physics program in FY 2008.



Biological and Environmental Research Brookhaven National Laboratory FY 2008 Performance Evaluation Science and Technology

Goal 1.0: Provide for Efficient and Effective Mission Accomplishment.

Weight: 50%

Score: 3.40 Grade: B+

Goal Evaluation:

BNL plays a lead role in BER's Atmospheric Radiation Measurement and Atmospheric Research Programs, and its scientists are internationally recognized.

BNL's radiochemistry and instrumentation research program scientists are world leaders, and their scientific contributions continue to make seminal advances in the field. This program is currently undergoing a difficult transition to focus on DOE relevant energy and environmental needs.

BNL's protein crystallography program has a high impact on its field, serving a large number of prominent biological scientists, especially in the Northeastern U.S.

BNL has a relatively small, high quality BER research portfolio spread across several program elements. BNL scientists in these programs are recognized nationally and internationally and conduct high impact research in climate, radiochemistry and instrumentation, and structural biology. The scientific results have a high impact in their respective fields and are regularly recognized for their high quality. Research results are completed in a timely manner.

Objective 1.1: Science and Technology Results Provide Meaningful Impact on the Field.

Weight: 30%

Score: 3.5 Grade: A-

Objective Evaluation:

BNL is recognized for their expertise in climate change research. BNL set the standard for the Free Air Carbon Dioxide Enrichment (FACE) experiments that have improved the understanding of the impact of climate change on the carbon cycle. BNL is also contributing to carbon sequestration research through instrument development. BNL has been productive in research to improve understanding of the aerosol effects on the radiation balance of climate. BNL published 38 papers in high quality peer reviewed journals such as Nature.

The radiochemistry and instrumentation research program made outstanding contributions to imaging science and technology in FY 2008, including (1) the development of a totally new synthesis of C-11-formaldehyde as a radiolabeling reagent which is broadly applicable to rapid synthesis of a variety of carbon-11-labeled molecules; (2) the development of a high-field MRI method for imaging low abundance metabolites (e.g. stem cells), and (3) the completion of the ratCAP, a unique and first in the world minia-turized PET scanner for imaging biochemical metabolism in the living objects expressing uncontrolled movement. BNL's scientific accomplishments in the area of detector development have made a significant impact in the field, for example in the area of compact motion imaging. These funda-mental research accomplishments in chemistry and instrument-a-tion build on DOE's investments in the physical



sciences. The Laboratory has built the foundation for broadening the power of imaging to also address critical national needs in energy and the environment.

The structural biology program primarily supports the Protein Crystallography (PX) program in the Biology department and at the National Synchrotron Light Source (NSLS). This program has a high impact on its field, serving a large number of prominent biological scientists, especially in the Northeastern U.S. The publications from the experiments at the PX stations by external users often are in the top tier journals, and frequently include PX staff as co-authors.

The two low-dose projects at BNL made valuable contributions to their field in FY 2008 developing a new method to measure clustered damages within cells and the cell's ability to remove them and using DNA sequence analysis to identify transcription factor binding sites in the human genome after low doses of ionizing radiation.

Objective 1.2: Provide Quality Leadership in Science and Technology.

Weight: 20%

Score: 3.3 Grade: B+

Objective Evaluation:

Most scientists in the radiochemistry program are highly accomplished, world renowned leaders in the fields of radiochemistry and radionuclide imaging instrumentation. The scientists in the PX program are highly regarded by the external community. The unique mail-in crystallography program has attracted many external collaborators, in large measure because of the strong intellectual involvement in their experiments by the local staff members.

BNL staff provide science leadership in Chief Scientist roles for the ARM Science and Atmospheric Science (ASP) Programs. The ASP Chief Scientist also played a lead role in developing the U.S. Climate Change Science Program Synthesis and Assessment Product 2.3. The Synthesis and Assessment Products were major deliverables for the interagency climate change research program. BNL is leading the effort for the ARM Climate Research Facility (ACRF) to develop a strategy for measuring a critical parameter for climate models, vertical velocity.

Objective 1.3: Provide and sustain Outputs that Advance Program Objectives and Goals.

Weight: 20%

Score: 3.5 Grade: A-

Objective Evaluation:

BNL climate change scientists published 38 papers in high quality peer reviewed journals such as Nature. Scientists in all aspects of the climate change research program have been very productive and their contributions have had an impact on the field. BNL results on aerosol cloud interactions have significantly improved climate model simulations. The current international experiment is designed to examine differences in chemical and microphysical properties of aerosols between remote marine air-masses and those air-masses that have been influenced by anthropogenic aerosols --- a critical climate modeling issue.

The radiochemistry group published 70 peer reviewed articles during 2007–2008, including two in the high impact journals Science, and Angewandte Chemie. The program also achieved high visibility of their accomplishments with articles on their research appearing in Nature Chemistry and Chemical & Engineering News. BNL is a leader in the field of instrumentation development for imaging.



The PX program generated a large number of protein structures in FY 2008. Protein Data Bank depositions from the PX beamline X29A were exceeded world-wide only by two beamlines at the Advanced Photon Source and two at the Stanford Synchrotron Radiation Laboratory, despite the NSLS being a much older machine with more limited capabilities compared to most of the others.

Objective 1.4: Provide for Effective Delivery of Products.

Weight: 30%

Score: 3.3 Grade: B+

Objective Evaluation:

Climate change program goals are primarily met on schedule and within budget. BNL is effectively leading an international field experiment on clouds and aerosols, an important scientific research area. The BNL Radiochemistry and Imaging Instrumentation group has strong links with public and private sector research organiza-tions enabling them to effectively leverage their federal research funding and to efficiently transfer new imaging technologies to the private sector for public use. The BNL Medical Department has attracted three pharma-ceutical indus-try sponsored Cooperative Research and Development Awards (CRADAs) in the last year to use PET imaging infrastructure for drug R&D. The PX program is highly effective in meeting program milestones and serving the user community.

Goal 2.0: Provide for Efficient and Effective Design, Fabrication, Construction and Operations of Research Facilities

Weight: 25%

Score: 3.71 Grade: A-

Goal Evaluation:

The protein crystallography program at the NSLS serves a large community of users, making use of a novel and efficient sample mail-in program that provides an especially noteworthy way to maximize use of the NSLS.

The protein crystallography program at the NSLS has attracted an outstanding exter-nal user community, equal to that of many better equipped, more modern synchrotrons. However, this outstanding program has had only modest effect on the biological research base at the laboratory.

Objective 2.1: Provide Effective Facility Design(s) as Required to Support Laboratory Programs.

Weight: N/A

Score: N/A Grade: N/A

Objective Evaluation:

N/A

Objective 2.2: Provide for the Effective and Efficient Construction of Facilities and/or Fabrication of Components.

Weight: N/A



Score: N/A Grade: N/A

Objective Evaluation:

N/A

Objective 2.3: Provide Efficient and Effective Operation of Facilities.

Weight: 90%

Score: 3.8 Grade: A

Objective Evaluation:

The PX program serves a large community of users. The mail-in program provides an especially efficient and effective way to maximize use of the NSLS: whenever a user group completes its experi-ments early, the PX staff immediately bring mail-in crystals to the beamline to use the freed-up time. The March 2008 merit review committee for the renewal of the PX program funding highlighted the extraordinary success of this activity as a reason for rating the overall program extremely highly.

Objective 2.4: Utilization of Facility to Grow and Support Lab's Research Base and External User Community.

Weight: 10%

Score: 2.9 Grade: B

Objective Evaluation:

The PX program at the NSLS has attracted an outstanding exter-nal user community, equal to that of many better equipped, more modern synchrotrons. However, this outstanding program has had only modest effect on the biological research base at the laboratory.

The \$34M NASA Space Radiation Laboratory (NSRL) employs beams of heavy ions extracted from Brookhaven's Booster accelerator. NSRL features its own beam line dedicated to radio-biology research, as well as state-of-the-art specimen-preparation areas. Within the NSRL target room, joint-funded NASA/DOE low dose program researchers and other NASA-sponsored scientists irradiate a wide variety of biological specimens. This facility thus is a valuable asset for the Laboratory's user community.

Goal 3.0: Provide Effective and Efficient Science and Technology Program Management.

Weight: 25%

Score: 3.10 Grade: B+

Goal Evaluation:

BNL has provided effective vision and leadership for its programs in climate, radiochemistry and instrumentation, and structural biology.

BNL management has maintained good communication with BER staff in its climate, radiochemistry and intrumentation, and structural biology programs but poor communication in its programs related to the Genomics: GTL program.



BNL has exhibited sustained world leadership in its medical research program. A significant challenge will be for BNL to develop and maintain new leadership capabilities as it makes the transition from medically-focused radiochemistry and instrumentation to a focus on energy and environmental needs.

Objective 3.1: Provide Effective and Efficient Stewardship of Scientific Capabilities and Program Vision.

Weight: 20%

Score: 3.1 Grade: B+

Objective Evaluation:

BNL is internationally recognized for their expertise in designing, building, and operating large-scale Free Air Carbon Enrichment (FACE) experiments that enable scientists to study the effects of global climate change on the natural ecosystem. Personnel requirements are adequately addressed. BNL has several leadership roles in climate research program.

A programmatic vision consistent with BER biological science missions is still in the early stages of development at the Laboratory for the radiochemistry area. The current program is highly innovative and productive, putting hypothetical concepts to practical use, e.g., rat CAP design validation, fabrication and validation for dynamic (non-restrained) imaging. However, their current strengths are mostly in areas outside current BER missions.

The biological science programs at the Laboratory do not show evidence of a strong programmatic vision, outside the PX program. The Laboratory participates only on the periphery of the major BER Genomics: GTL biology program, recently developing a plant biology program aiming to generate a virtual model for cell wall trafficking and assembly.

Objective 3.2: Provide Effective and Efficient Science and Technology Project/Program Planning and Management.

Weight: 30%

Score: 3.3 Grade: B+

Objective Evaluation:

Planning is consistent with DOE climate change priorities. The Chief Scientists have been very effective in assisting DOE in program planning. However, BNL is encouraged to prepare better budget estimates for its support of field campaigns.

The shift of the radiochemistry and instrumentation research focus from medical research to that directly aligned with the BER energy and environment mission needs has been started and is being well managed. For example, Medical Department scientists have LDRD funding to develop labeled nanoparticles and to develop a plant epigenetic program. A Biology Department LDRD has an imaging component leveraging the PET isotope production and imaging facilities. These LDRD projects are aimed at developing programs in line with the DOE objectives which can grow into Office of Science sponsored research.

The structural biology PX program is extraordinarily well planned, as evidenced by the outstanding rating given it in the comprehensive merit review held in March 2008. However, the smaller programs (Ultraviolet Spectroscopy at the NSLS and Scanning Transmission Electron Microscopy) have seen less success in planning. The latter especially needs a decision on its continuation now that the NIH has discontinued funding.

So far there has been no indication that effort has been put into achieving effective synergy between the two areas of low dose research within BNL.



BNL has a thorough Human Subject protection program. Additionally, BNL is jointly, with Stony Brook University (which has the Institutional Review Board of record for BNL) applying for accreditation under the Association for Accreditation of Human Research Protection Programs (AAHRPP).

Objective 3.3: Provide Efficient and Effective Communications and Responsiveness to Customer Needs.

Weight: 50%

Score: 3.1 Grade: B+

Objective Evaluation:

BNL communications in its climate change research program are excellent. BNL provides prompt responses to requests for information. Management of the radiochemistry program is highly efficient in providing rapid and timely responses to programmatic needs, and contributing information on program research highlights. Management of the biological programs has provided input to BER at regular intervals; however, BNL management has not been particularly proactive in bringing information to BER program staff during FY 2008. In general, more communication has come from BNL biological scientific staff than from BNL management for this area.



High Energy Physics Brookhaven National Laboratory FY 2008 Performance Evaluation Science and Technology

Goal 1.0: Provide for Efficient and Effective Mission Accomplishment.

Weight: 40%

Score: 3.39 Grade: B+

Goal Evaluation:

There is no evaluation provided at the Goal level.

Objective 1.1: Science and Technology Results Provide Meaningful Impact on the Field.

Weight: 30%

Score: 3.4 Grade: B+

Objective Evaluation:

he lab's most significant activity in the experimental high energy physics program is their involvement in ATLAS at the CERN Large hadron Collider (BNL). BNL hosts the Tier Computing Center and is developing an Analysis Support Center.

The BNL D-Zero group has been essential in the extraction of physics results from the Tevatron Run II program, emphasizing W, tau, and Z physics. It has also been central in MINOS data analysis.

A recent peer review of all HEP supported laboratory theory groups called out BNL for their impact on the field given the size of the group.

Objective 1.2: Provide Quality Leadership in Science and Technology.

Weight: 30%

Score: 3.4 Grade: B+

Objective Evaluation:

BNL has extensive leadership positions in the US ATLAS collaboration, manages the US ATLAS operations program and hosts the ATLAS Tier 1 computing center.

BNL has been extensively involved in developing the physics case for a long-baseline neutrino detector that was just endorsed as part the P5 roadmap for the field of high energy physics. BNL staff have been critical to the theoretical argument for the experiment and the experimental concepts.

BNL with LBNL is building the Daya Bay Reactor experiment which when completed will provide the most sensitive measurement of the neutrino mixing angle, sin(q13). Mike Harrison is the Director of the Americas Regional Team of the ILC Global Design Effort. .



Objective 1.3: Provide and sustain Outputs that Advance Program Objectives and Goals.

Weight: 30%

Score: 3.4 Grade: B+

Objective Evaluation:

BNL hosts the Accelerator Test Facility (ATF), where accelerator science experiments are conducted. In FY 2008 ATF staffing was increased improving its performance.

BNL theory group has made strong contributions to the physics of the LHC, neutrino physics, and lattice QCD.

Objective 1.4: Provide for Effective Delivery of Products.

Weight: 10%

Score: 3.3 Grade: B+

Objective Evaluation:

BNL is the host lab for US ATLAS and has built the US ATLAS Tier 1 computing center. Data challenges this year which sought to simulate the reconstruction, distribution, and analysis chain from CERN through Tier 1 to Tier 2 facilities was successful and gives assurance that the computing system will be ready for data.

BNL also manages the M&O program for US ATLAS and has successfully led the commissioning of the US contributions to ATLAS.

Goal 2.0: Provide for Efficient and Effective Design, Fabrication, Construction and Operations of Research Facilities

Weight: 30%

Score: 3.4 Grade: B+

Goal Evaluation:

The only current fabrication project being undertaken by BNL for HEP is the Daya Bay Reactor Experiment. It is on currently on schedule and within budget.

Objective 2.1: Provide Effective Facility Design(s) as Required to Support Laboratory Programs.

Weight: 50%

Score: 3.4 Grade: B+

Objective Evaluation:

BNL is working with LBNL on the Daya Bay Reactor experiment. Daya Bay received CD-2/3a in March 2008. The project scientist, who is the scientific liaison to the project manager, is from BNL. BNL high energy physics group is involved in the muon subsystem, mechanical engineering of the detector structure, and integration and testing. The BNL chemistry department has play a critical role in the development of the liquid scinitillator. The lab also supplies the safety officer for the experiment.



Objective 2.2: Provide for the Effective and Efficient Construction of Facilities and/or Fabrication of Components.

Weight: 50%

Score: 3.4 Grade: B+

Objective Evaluation:

Daya Bay received CD-3B approval in August on schedule. The BNL contributions to Daya Bay were detailed in 2.1.

The major fabrication effort (post CD-2) at BNL for the ATLAS project has been completed. BNL has met all of their milestones on time and on budget.

Objective 2.3: Provide Efficient and Effective Operation of Facilities.

Weight: N/A

Score: N/A Grade: N/A

Objective Evaluation:

N/A

Objective 2.4: Utilization of Facility to Grow and Support Lab's Research Base and External User Community.

Weight: N/A

Score: N/A Grade: N/A

Objective Evaluation:

N/A

Goal 3.0: Provide Effective and Efficient Science and Technology Program Management.

Weight: 30%

Score: 3.24 Grade: B+

Goal Evaluation:

There is no evaluation provided at the Goal level.

Objective 3.1: Provide Effective and Efficient Stewardship of Scientific Capabilities and Program Vision.

Weight: 40%

Score: 3.5 Grade: A-



Objective Evaluation:

BNL has been well-aligned with national priorities. They participate at a high level in the ATLAS experiment at the LHC one of the field's highest priorities. They have reoriented their program in muon and kaon physics towards neutrinos which are increasingly important to the field. The lab stepped in the help provide critical scientific manpower for the Daya Bay Project with LBNL, and they have been important to planning a long-baseline neutrino program in collaboration with FNAL.

Objective 3.2: Provide Effective and Efficient Science and Technology Project/Program Planning and Management.

Weight: 40%

Score: 2.9 Grade: B

Objective Evaluation:

Management of the ATLAS operations program could be stronger. There have been planning failures such as the failure to anticipate the need for additional computing infrastructure. A well know fact the overhead rate on the operation program would increase was not dealt with until the last moment. The ATLAS upgrade proposal was unrealistic, since it did not justify the desired start time. There was problem with power supplies for ATLAS produced by a subcontractor, MDI. BNL corrected the technical problem, but is now being sued by MDI for intellectual properties violations.

Planning on Daya Bay has been effective.

Objective 3.3: Provide Efficient and Effective Communications and Responsiveness to Customer Needs.

Weight: 20%

Score: 3.4 Grade: B+

Objective Evaluation:

Communications with headquarters have generally met expectations..



Nuclear Physics Brookhaven National Laboratory FY 2008 Performance Evaluation Science and Technology

Goal 1.0: Provide for Efficient and Effective Mission Accomplishment.

Weight: 40%

Score: 3.97 Grade: A

Goal Evaluation:

The BNL nuclear physics group performs at a high level in all areas in mission accomplishment and merits a grade of A:

Impact of the RHIC in the area of research into hot, dense nuclear matter is deemed outstanding, as demonstrated by an impressive number of scientific measurements.

Significant contributions have been made to the STAR and PHENIX experiments that included continuing leadership responsibilities in maintaining detector and technical infrastructure and detector upgrades (e.g. Time-of-Flight, Forward Meson Detector, and the Hadron Blind Detector).

The nuclear theory effort has high impact in the programmatic area of hot, dense nuclear matter. The Lattice Quantum ChromoDynamics (LQCD) research group is recognized for world-class leadership in finite temperature LQCD.

Publication record is impressive in quantity and quality. BNL groups are principal authors on \sim 60% of refereed publications from RHIC data.

DOE and RHIC goals and milestones are largely met on time and within prevailing budgets.

National Nuclear Data Center (NNDC) provides visionary and effective leadership for the national nuclear data program to accomplish its mission.

The neutrino physics group (Chemistry) provides effective research and development of scintillators for planned neutrino experiments.

The scores and grades for Goals 1-3 are based on the annual DOE S&T review (peer review), communication to NP at the February Laboratory Managers' Briefings, Project Reviews (peer review), quarterly reports by project contract managers, biweekly teleconferences, NP program manager's observations at national meetings, and NP program manager's judgment.

Objective 1.1: Science and Technology Results Provide Meaningful Impact on the Field.

Weight: 35%

Score: 4.1 Grade: A+

Objective Evaluation:

The 2008 DOE Science and Technology (S&T) panel review evaluated the RHIC experimental and theoretical research programs as being high-quality and original as demonstrated by many impressive scientific measurements and numerous publications that have appeared in refereed journals. The impact of the RHIC research program was considered to be outstanding.



The nuclear theory program has substantial impact on the RHIC physics program in the study of hot, dense nuclear matter and the spin structure of the proton. The LQCD theory effort at BNL is acknowledged internationally for their seminal contributions to the study of finite temperature QCD and the quark-gluon plasma, using high performance computing.

The National Nuclear Data Center (NNDC) is managed by BNL. The researchers are developing the methods, techniques, and data for co-variance matrices required by simulations of reactors with advanced fuel cycles. The geographical usage of the web-based nuclear data services of the NNDC continues to have a worldwide wide impact with primary users from the USA (~42%), the European Union (~26%) and other countries (~32%).

The BNL neutrino physics group makes effective contributions to leading experiments in the field, especially in the area of chemistry and scintillator development.

Objective 1.2: Provide Quality Leadership in Science and Technology.

Weight: 25%

Score: 4.0 Grade: A

Objective Evaluation:

The contributions of the local BNL science groups on PHENIX and STAR experiments, is regarded as being vigorous and highly successful in producing forefront physics while taking on leading roles in the development of detector hardware, such as the Time-of-Flight detector and Forward Meson Spectrometer upgrade of the STAR experiment and the integration of the Silicon Tracking detectors in the PHENIX experiment..

The leadership of the BNL LQCD group is playing a very visible role in the national and international effort on lattice QCD, and the associated planning for dedicated computer resources for finite temperature QCD studies.

The NNDC coordinates and leads the national nuclear data program, and plays an important role in the international activities such as interactions with the IAEA. Workshops are held to train and involve new talent as evaluators, especially internationally.

The neutrino physics group conducts research and development on scintillators necessary for several neutrino experiments being planned or built.

Objective 1.3: Provide and sustain Outputs that Advance Program Objectives and Goals.

Weight: 25%

Score: 4.0 Grade: A

Objective Evaluation:

Independent experts and/or peers commend the RHIC/BNL experimental results. Publications and citations exceed the amount and/or quality typically expected for an excellent body of work. Both the Nuclear Theory and Lattice Gauge Groups continue to be highly productive, as reflected in a large number of refereed publications (~50 refereed publications in FY 2007).

The NNDC contributes to the sustained output of evaluated nuclear reaction and decay data by the national program. The first major release of the evaluated nuclear reaction ENDF/B-VIII library for science and technology applications since 1990 is a significant accomplishment. The number of data retrievals from the US Nuclear Data Program databases has reached a milestone of 2 million per year.



Publications by the SNO collaboration, including BNL co-authors, are highly cited.

Objective 1.4: Provide for Effective Delivery of Products.

Weight: 15%

Score: 3.6 Grade: A-

Objective Evaluation:

Program/project goals and/or milestones are primarily met on schedule and within prevailing budgets. The RHIC research program objectives are well aligned to all NP heavy-ion and spin-physics milestones identified in the NSAC report on performance goals. NSAC milestones are generally met and RHIC management has effectively responded to all the 2007 DOE S&T review recommendations.

The NNDC provides effective online services to provide evaluated nuclear data free of charge world-wide.

The BNL neutrino group has successfully developed candidate scintillator materials for experiments to measure neutrino oscillation parameters.

Goal 2.0: Provide for Efficient and Effective Design, Fabrication, Construction and Operations of Research Facilities

Weight: 40%

Score: 4.08 Grade: A+

Goal Evaluation:

The BNL nuclear physics group performs at a high level in all areas of design, fabrication, and operation of research facilities and merits a grade of A+:

- Delivery of RHIC heavy ion beams to experiments significantly exceeded expectations.
- CA-D staff continues to develop beams for the future research program.
- Research and development of stochastic cooling will lead to a cost effective luminosity upgrade.

Objective 2.1: Provide Effective Facility Design(s) as Required to Support Laboratory Programs.

Weight: 0%

Score: N/A Grade: N/A

Objective Evaluation:

N/A

Objective 2.2: Provide for the Effective and Efficient Construction of Facilities and/or Fabrication of Components.

Weight: 0%



Score: N/A Grade: N/A

Objective Evaluation:

N/A

Objective 2.3: Provide Efficient and Effective Operation of Facilities.

Weight: 85%

Score: 4.2 Grade: A+

Objective Evaluation:

The RHIC Collider-Accelerator Division's (C-AD) performance in delivering heavy ion beam has significantly exceeded expectations. C-AD has delivered ten times more integrated d+Au beam luminosity than achieved in the previous run in 2003 and ~2.3 more than the planned minimum goal for 2008. The C-AD has successfully demonstrated the retention of proton beam polarization at the maximum acceleration energy and for the first time collided Au+Au at 9.2 GeV. The number of delivered hours was within 80% of planned hours. PART/Joules goals for scientific productivity and reliability of the machine were exceeded.

The Division's pursuit of innovative accelerator R&D is recognized by significant awards to its staff. The RHIC beam luminosity upgrade is now planned to be accomplished by stochastic beam cooling providing new capabilities five years earlier at significant cost saving. The C-AD staff is commended for its outstanding performance and leadership.

The Electron Beam Ion Source (EBIS) construction project is proceeding on schedule to meet the CD4 milestones of Q4 FY2010.

The safety record of the C-AD and RHIC has continued to improve over the past ten years according to the data on performance and backward-looking indicators. The C-AD has the lowest DART (\sim 0.3) and TRC (\sim 0.9) rates at BNL.

Objective 2.4: Utilization of Facility to Grow and Support Lab's Research Base and External User Community.

Weight: 15%

Score: 3.4 Grade: B+

Objective Evaluation:

The utilization of the RHIC facility by external users remains steady.

Goal 3.0: Provide Effective and Efficient Science and Technology Program Management.

Weight: 20%

Score: 3.48 Grade: A-

Goal Evaluation:

The BNL nuclear physics group performs at a high level in all areas of science and technology program management and merits a grade of A-:



- New leadership providing a vision for the RHIC program and initiating discussion of a future Electron-Ion Collider (EIC).
- The RHIC mid-term plan of detector upgrades, luminosity upgrades and new beams remains meritorious.
- Provides very effective stewardship and strategic management of the nuclear theory relevant to the RHIC physics program.
- The NNDC leads the national nuclear data program effectively and has planned for succession to a new Director.
- Management of detector upgrade projects continues to be a concern.

Objective 3.1: Provide Effective and Efficient Stewardship of Scientific Capabilities and Program Vision.

Weight: 40%

Score: 4.0 Grade: A

Objective Evaluation:

The 2008 DOE S&T review commended the new Associate Laboratory Director (ALD) for Nuclear and Particle Physics for clearly taking leadership of the RHIC management and providing a vision for the future RHIC physics program as well as initiating scientific discussion of a potential Electron Ion Collider (EIC) program.

The 2008 review also reaffirmed the merits of the BNL updated mid-term strategic plan for future detector upgrades and the new research opportunities afforded by the planned RHIC luminosity upgrades and the development of low-energy heavy-ion beams.

BNL provides effective stewardship of the nuclear theory relevant to the RHIC experimental program in hot, dense nuclear matter and the spin structure of the proton. BNL has worked aggressively to establish and advance a highly successful finite-temperature LQCD program.

The NNDC continues to lead the national nuclear data program, by effectively coordinating the entire U.S. program, and interacting with the international community, and identifying program needs such as attracting and training future nuclear data evaluators.

Objective 3.2: Provide Effective and Efficient Science and Technology Project/Program Planning and Management.

Weight: 40%

Score: 3.0 Grade: B

Objective Evaluation:

The effective management of detector upgrade projects was a principal concern at the 2008 DOE S&T review. Capital equipment projects near the MIE threshold were initiated prior to robust cost and schedule determination. The Nose Cone Calorimeter (NCC) project did not pass a DOE CD0 scientific review.

BNL management has developed an effective strategy, within the limited resources available, to retain the services of one of the recognized world leaders in LQCD theory and computing, and to maintain a vibrant nuclear theory program overall.



BNL management is appropriately maintaining and developing core competencies in support of the DOE Nuclear Physics Program goals.

The NNDC has a succession plan that identifies a qualified candidate to be its next Director.

Objective 3.3: Provide Efficient and Effective Communications and Responsiveness to Customer Needs.

Weight: 20%

Score: 3.4 Grade: B

Objective Evaluation:

The Laboratory's local research groups' experimental support responsibilities are stressed. RHIC management needs to ensure adequate staff support is provided for operations and maintenance of the experiments.

The NNDC leadership communicates with NP as necessary.



Workforce Development for Teachers and Scientists Brookhaven National Laboratory FY 2008 Performance Evaluation Science and Technology

Goal 1.0: Provide for Efficient and Effective Mission Accomplishment.

Weight: 65%

Score: 3.80 Grade: A

Goal Evaluation:

The Brookhaven National Laboratory's Office of Educational Programs does an excellent job in managing the WDTS programs. Their strength lies in the fact that the staff is singularly committed to ensuring that all WTDS participants have a quality laboratory research experience. All participants are fully integrated into the BNL laboratory culture and become part of the BNL "family". All program deliverables (research abstracts, full length papers, posters, portfolios) are of the highest quality and validate a significant achievement for research interns and educators. The education program office has positioned itself as a central contributor to the laboratory operation. Mentor researchers look to the education office for competent, much needed research support.

Objective 1.1: Science and Technology Results Provide Meaningful Impact on the Field.

Weight: 25%

Score: 3.8 Grade: A

Objective Evaluation:

- BNL has aligned itself to many university systems throughout the northeast and seeks
 interns and educators that are positioned to become part of the BNL extended
 community.
- BNL has developed multiple "entry" programs that are pathways, particularly for underrepresented populations, to longer term research experiences.

Objective 1.2: Provide Quality Leadership in Science and Technology.

Weight: 30%

Score: 3.8 Grade: A

Objective Evaluation:

- BNL matches research interns and educators with mentors who are funded by SC and are thus are in critical mission research, especially in the life sciences.
- The education programs are committed to improving how they are managed and they are driven to process improvement by data and partner evaluation.

Objective 1.3: Provide and sustain Outputs that Advance Program Objectives and Goals.

Weight: 30%

Score: 3.8 Grade: A



Objective Evaluation:

- Educators and interns, through enrichment activities and seminars are fully informed on the use and operation of BNL's user facilities, research within their divisions, and research competencies of other DOE laboratories.
- BNL has developed the "Open Space Stewardship Program" which is a model of
 collaboration between government, schools, and community partners to teach
 environmental sciences and reclaim distraught land sites.

Objective 1.4: Provide for Effective Delivery of Products.

Weight: 15%

Score: 3.8 Grade: A

Objective Evaluation:

- BNL creatively matches educators and interns from different programs as collaborators
 where an educator can use his/her classroom experience combined with the research
 project to develop real time instructional material. A DOE ACTS educator will work
 with a Pre-service teacher intern to develop science instruction and then use to instruct
 middle and high school students visiting the laboratory.
- BNL leverages resources from different sciences agencies to maximize the laboratories
 opportunities to provide research experience. Funding from NSF and DHS are used to put
 interns and educators in a research collaborations where their talents complement one
 another, leverage knowledge and build durable relationships.

Goal 2.0: Provide for Efficient and Effective Design, Fabrication, Construction and Operations of Research Facilities

Weight: N/A

Score: N/A Grade: N/A

Goal Evaluation:

N/A

Objective 2.1: Provide Effective Facility Design(s) as Required to Support Laboratory Programs.

Weight: N/A

Score: N/A **Grade:** N/A

Objective Evaluation:

N/A

Objective 2.2: Provide for the Effective and Efficient Construction of Facilities and/or Fabrication of Components.

Weight: N/A

Score: N/A Grade: N/A



Objective Evaluation:

N/A

Objective 2.3: Provide Efficient and Effective Operation of Facilities.

Weight: N/A

Score: N/A Grade: N/A

Objective Evaluation:

N/A

Objective 2.4: Utilization of Facility to Grow and Support Lab's Research Base and External User Community.

Weight: N/A

Score: N/A Grade: N/A

Objective Evaluation:

N/A

Goal 3.0: Provide Effective and Efficient Science and Technology Program Management.

Weight: 35%

Score: 3.80 Grade: A

Goal Evaluation:

BNL's Office of Educational Program is a highly motivated well managed team that works continually to integrate science education and workforce development into the research mission of the laboratory. BNL has advanced the education culture within the laboratory by supplying a well prepared, dedicated pool of undergraduate interns and educators.

Objective 3.1: Provide Effective and Efficient Stewardship of Scientific Capabilities and Program Vision.

Weight: 20%

Score: 3.8 Grade: A

Objective Evaluation:

BNL's Office of Educational Program is a highly motivated well managed team that works continually to integrate science education and workforce development into the research mission of the laboratory. BNL has advanced the education culture within the laboratory by supplying a well prepared, dedicated pool of undergraduate interns.

Objective 3.2: Provide Effective and Efficient Science and Technology Project/Program Planning and Management.

Weight: 40%



Score: 3.8 Grade: A

Objective Evaluation:

Students and educators are positioned to assist one other collaboratively in producing research abstracts and full papers. They work as teams to develop skills in poster presentations, power points, and others tools required to effectively communicate science accomplishments.

Objective 3.3: Provide Efficient and Effective Communications and Responsiveness to Customer Needs.

Weight: 40%

Score: 3.8 Grade: A

Objective Evaluation:

- The educational office and its staff are excellent advisors and collaborators with WDTS
 as we moves to improve program components, and help meet laboratory needs now and
 in the future, and leverage resources.
- The education office is a leader in managing WDTS programs at the laboratory and is a always willing to share best practices with other laboratories.